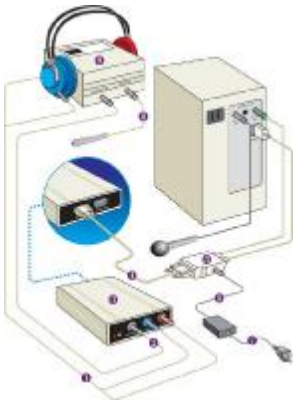
DOEHRS-HC Audiometer Refresh

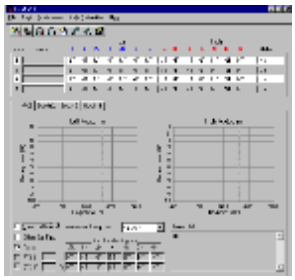
A Comprehensive Training Course
&
Training Manual

System Support and Service

Benson Medical Instruments Co.

CCA-200mini / BAS-200 Audiometric System





SRMi Consulting, LLC
PO Box 190
Mountain, WI 54149-0190
USA

www.srmi.com • skipm@srmi.com
(715) 276-2947Office • (715) 850-1568 24/7

Copyright 2008 SRMi Consulting, LLC

This document is provided under Copyright by SRMi Consulting, LLC and Benson Medical Instrument Co. and may be reproduced with written permission from the above copyright owners.

Permission is granted to the Department of Defense to reproduce in written form per the following contract:

Contract #W81XWH08C0071

DOEHRS AUDIOMETERS PURCHASE, IMPLEMENTATION AND TRAINING

Audiometer Technical Training Course

Table of Contents

Presentation Slides	**5**
CCA-200mini / BAS-200 Operators Manual	69
Sample Calibration Forms	357
Calibration Systems	367

Copyright 2008 SRMi Consulting, LLC

This Page is blank

Copyright 2008 SRMi Consulting, LLC

Audiometer Technical Training Course



Presentation Slides

System Support and Service

Benson Medical Instruments Co.

CCA-200mini / BAS-200 Audiometric System

DOEHRS-HC Audiometer Refresh

SRMi Consulting, LLC

Lindor “Skip” Maletzke

(715) 276-2947

(715) 850-1568 Cell 24/7

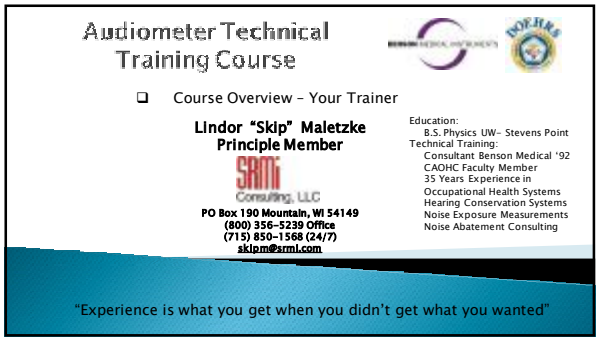
skipm@srmi.com

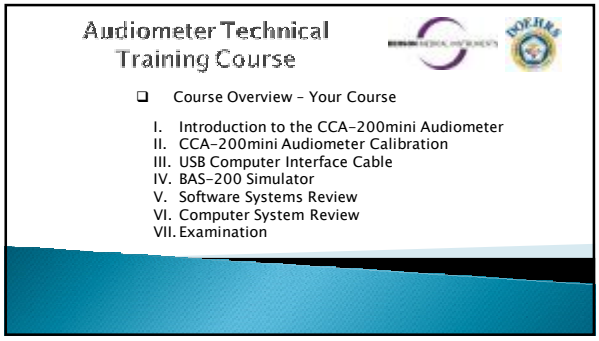
Copyright 2008 SRMi Consulting, LLC

This Page is blank

Copyright 2008 SRMi Consulting, LLC







Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- Introduction to the CCA-200mini Audiometer
  - I. **CCA-200mini System Audiometer (CLIN 0003)**
    - I. CCA-200mini System Audiometer includes:
      - A. CCA-200mini Systems Audiometer
      - B. Headset with headband and cord
      - C. Response Switch (moisture proof and dust tight)
      - D. Software CD
      - E. USB Computer Interface Cable (described below)
      - F. Serial Extension Cable, 25 ft.
      - G. Booth Mounting Plate
      - H. Mounting Screws
      - I. Power Supply
      - J. Power Cord, 110V
      - K. Calibration Certificate

Audiometer Technical Training Course

- Introduction to the CCA-200mini Audiometer
  - I. **CCA-200mini System Audiometer (CLIN 0003)**

CCA-200mini Systems Audiometer

The CCA-200min Computer Controlled Audiometer is a Microprocessor Instrument applying State-of-the-Art Technologies to the Science of Hearing Testing.



Audiometer Technical Training Course

- Introduction to the CCA-200mini Audiometer
  - I. **CCA-200mini System Audiometer (CLIN 0003)**

CCA-200mini Systems Audiometer



CCA-200mini Headphone and Response Jack

Serial In / Serial Out Jacks





CCA-200mini Model Label

Service Address and Serial Number



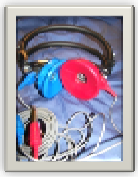
Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- Introduction to the CCA-200mini Audiometer
  - I. **CCA-200mini System Audiometer (CLIN 0003)**

Headset with headband and cord

The Benson CCA-200mini Headset provides a stable easily maintained set of components Including:
- Telephonics THD39P Headphones w/ .035 Set Screws
- Benson Headset Cord Set
  - ¼" Phone to Headset Yoke – Color Code
    - Red – Right
    - Blue – Left
- MX51AR Color Coded Ear Cushions
- WE Static Force Padded Headband



Audiometer Technical Training Course

- Introduction to the CCA-200mini Audiometer
  - I. **CCA-200mini System Audiometer (CLIN 0003)**

Response Switch (moisture proof and dust tight)

The Benson Handswitch provides consistent testing with little client fatigue. Rated at 1,000,000 presses it yields a mean life of 16 – 18 months in heavy use environments.

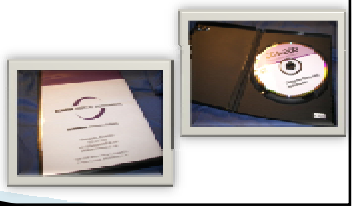


Audiometer Technical Training Course

- Introduction to the CCA-200mini Audiometer
  - I. **CCA-200mini System Audiometer (CLIN 0003)**

Software CD

The Benson System Software delivered with the System is CCA-200miniVersion 6.0 The Jacket and CD Title will designate the current version. Version 6.20 or higher must be used.



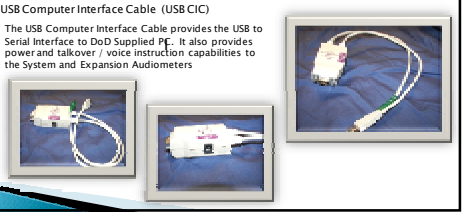
Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- Introduction to the CCA-200mini Audiometer
  - I. **CCA-200mini System Audiometer (CLIN 0003)**

USB Computer Interface Cable (USB CIC)

The USB Computer Interface Cable provides the USB to Serial Interface to DoD Supplied PC. It also provides power and talkover / voice instruction capabilities to the System and Expansion Audiometers



Audiometer Technical Training Course

- Introduction to the CCA-200mini Audiometer
  - I. **CCA-200mini System Audiometer (CLIN 0003)**

Serial Extension Cable, 12 ft.

The Serial Extension Cable shipped standard with the System Audiometer is 12'. This cable will provide signal control, power and talkover functions to the Audiometers. The site-dictated length will be supplied by Benson Authorized Installation Professionals during the on-site installation. Lengths of 6', 12', 25' and 50' are available as needed.



Audiometer Technical Training Course

- Introduction to the CCA-200mini Audiometer
  - I. **CCA-200mini System Audiometer (CLIN 0003)**

Booth Mounting Plate

The CCA-200mini Booth Mounting provides a convenient, stable means to place the Audiometer in the Audiometric Test Booth. This mounts within the BAS-200 Simulator Bracket. The bracket allows the CCA-200min to be installed with the Data Cables entering and exiting at the top and the Headphone Jacks at the bottom for clean, professional and secure installation.



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- Introduction to the CCA-200mini Audiometer

I. **CCA-200mini System Audiometer (CLIN 0003)**

Power Supply & Power Cord, 110V

The Power Supply provides all System power for Single and Multiple Audiometer Installations. This 24VDC Switching Supply will allow input voltages from 100 - 240 VAC 47 - 63 Hz and a nominal 24VDC 50W Max output. The Switched DC provides easy access for the Technician while limiting Client Access.



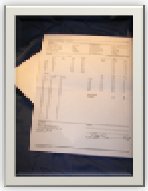
Audiometer Technical Training Course

- Introduction to the CCA-200mini Audiometer

I. **CCA-200mini System Audiometer (CLIN 0003)**

Calibration Certificate

The Calibration Certificate documents a full ANSI Exhaustive Calibration. The Calibration is completed by Benson Medical Instruments Co. Trained Staff using a custom-designed software-controlled calibration system and a currently certified Larson Davis 824 Audiometer Calibration Kit. The calibration process uses both acoustic and electrical measurements to insure the CCA-200mini exceeds all applicable ANSI 3.6 - 1989 Standards



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration

II. Theory of Operation

The CCA-200mini is a software based computer controlled audiometer accessed by a unit ID (Serial Number) for all testing, maintenance, and calibration functions.



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  II. Theory of Operation

PC Hardware Requirements (version 6.20 software)
The audiometer software requires an IBM PC-compatible computer with a 1 GHz or higher processor running Microsoft Windows® XP SP2, 2000 SP4, or Vista; minimum 256 megabytes (2000/XP) or 1 GB (Vista) RAM; and 500 megabytes free hard drive. Talk-over and voice instructions: SoundBlaster 16 or 100% compatible full-duplex sound card and microphone are required.
For the CCA-200mini, one free USB port is required.

Audiometer Technical Training Course

- **CCA-200mini Audiometer Calibration**
  II. Theory of Operation – Audiometer Specification

The CCA-200mini audiometer meets or exceeds ANSI S3.6-1989.
Dimensions: 3¼ in. x 5¼ in. x 1⅜ in.
Weight: 3 lbs. with accessories
Case: White ABS chassis
Storage Temp. Range: 0-120° F (-18-49° C)
Operating Temp. Range: 50-90° F (10-32° C)
Operating Humidity: 20-80 %, non-condensing

Audiometer Technical Training Course

- **CCA-200mini Audiometer Calibration**
  II. Theory of Operation – Audiometer Specification

The CCA-200mini audiometer meets or exceeds ANSI S3.6-1989 – Continued.
Test Frequencies: 500, 1k, 2k, 3k, 4k, 6k, 8kHz, crystal-controlled
Stimulus: Continuous (1 second) or Pulsed (200ms pulse, 2.5 pulses/second)
Output Level: -10-100 dBHL ± 3dB, 5dB step
Output Rise/Fall Time: Not greater than 50msec, nor less than 20msec, 30msec typ.
Distortion: Less than 3% at full output
Output On/Off Ratio: Greater than 70dB, 95dB typ.
Transducer: Telephonics TDH39 10-ohm earphones with MX41/AAR cushions
Power requirements: 100-240 VAC, 50-60 Hz, 3 Watts max

Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  II. Theory of Operation

A. USB Plug and Play connection to computer for up to sixteen audiometer stations
   A. Daisy Chained for ease of installation
   B. USB to Serial for added cable length and integrity
   C. Standard "Off the Shelf" Cables

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  II. Theory of Operation

B. Intelligent IntelliTesting software scans during testing, and automatically flags or retests.
   A. The innovative IntelliTesting feature understands Hearing Conservation testing. It scans audiograms for test problems, and responds appropriately. Test instructions are delivered to the subject through the headset. Previous test information from the database is used to streamline testing. The result is higher-quality tests, with less operator intervention, in less time.

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  II. Theory of Operation

C: Audiometer Operation
A: The CCA-200*mini provides the ultimate in easy testing—push* "Start" and the CCA-200*mini takes control. The CCA-200mini* detects a wide variety of subject errors for test validity. Easy-to use Windows® software gives you total control of up to sixteen audiometers from a single PC.
B: Delivers automatic instructions for subject errors in sixteen languages through headset.
C: On-screen audiogram graphs update in real time and display subject's baseline.

Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

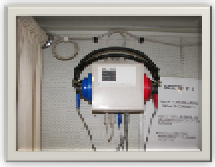
- CCA-200mini Audiometer Calibration
  II. Theory of Operation

C: Audiometer Operation – continued
D: Automatic Retests enhance quality and reduce problem audiograms.
E: Mark For Retest reduces manual testing.
F: Enhanced test features for 25% to 40% faster testing.
G: Programmable test sequences, start and end levels.
H: Full manual control.

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

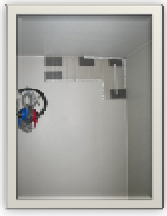
The CCA-200mini is installed in the preferred method as an in-booth mount as shown at the right. Normal Installation location is 5 ½" from the ceiling and 5 ½" from the side wall.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

An Installation Template is available from SRMi Consulting, LLC.
(800) 356-5239 or sales@srmi.com



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

The In-Booth mount provides advantages in that the Jack Panels, Patch Cords and Booth Wiring is eliminated. It starts with a BAS-200 Wall Mount Bracket installation…



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

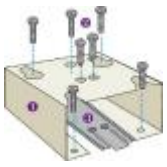
This is followed by the CCA-200mini Wall Mount Bracket. The bracket is installed in the BAS-200 Bracket by three screws matching the punched holes in the BAS-200 Bracket.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

This is followed by the CCA-200mini Wall Mount Bracket. The bracket is installed in the BAS-200 Bracket by three screws matching the punched holes in the BAS-200 Bracket.



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

The CCA-200mini is then slide into the mounting Bracket. This will orient the Serial Cable up to allow easy cable dress for a professional installation.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

The BAS-200 Simulator is then slid into the BAS-200 Mounting Bracket. Orient the BAS-200 so the Audiometer Jack and Response Jack down and the Right Phone Cup is on the Right.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

Attach the Serial Cables to the CCA-200mini – Computer (Female DB9) comes from the Computer or the Previous CCA-200mini. The Expansion (Male DB9) go to the next CCA-200mini in a multiple station installation. This is shown with optional BAS-200slm so Item 4 would continue to the next CCA-200mini



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

A 6-in. ¼-in. Phone Cable will connect the BAS-200 Simulator with the CCA-200mini Response Jack.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

The Completed Installation will have a CCA-200mini and BAS-200 Simulator paired for each test station. Color Coding of the CCA-200mini Jacks will reduce errors in the field.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

Cabling should routed through the Jack Panel, Under the Jack Panel, or though a Access Hole drilled for cable access. A through Jack Panel is shown.



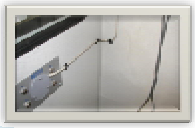
Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

Cabling should be dressed for a professional installation and to reduce cable issues with the subjects being tested.

Always work from the Audiometer to booth access point to remove any slack in the cable

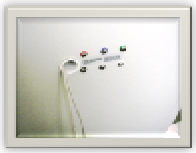




Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

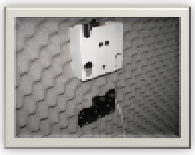
Example of a Booth Access Option. It provides a 1-½" Access through the booth wall and is packed with Acoustic Putty and covered with a 2" x 4" Stainless Steel Plate



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

Example of an under Jack Panel Installation. The Jack Panel Box was removed; the cable routed next to it and then reinstalled.

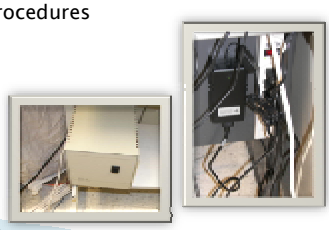


Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

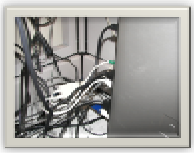
Install the Sola Power Conditioner and TripLite Surge Protector Power Strip and dress cords as needed.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

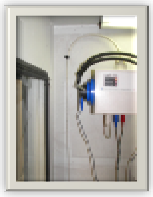
Install to the computer, the USB Computer Interface Cable (USB-CIC) and attach the USB-CIC to serial cable from Test Booth.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Installation Procedures

This concludes the CCA-200mini Hardware Installation.



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Assembly/Disassembly Procedures

The CCA-200mini is a solid state instrument with limited user-serviceable parts and procedures in the instrument case.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Assembly/Disassembly Procedures

The CCA-200mini case has access through the two (2) Philips Head screws on the bottom of the case. Care must be taken when opening the case as not to break the case. Normal Anti-Static procedures should be followed.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Assembly/Disassembly Procedures

The components are surface mount soldered – soldering of any component other than Jack connections is not recommended. Care must be taken when opening the case as not to break the case. Normal Anti-Static procedures should be followed.

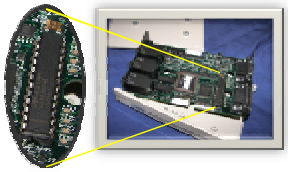


Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Assembly/Disassembly Procedures

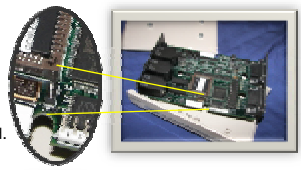
The only user replaceable component is the 24 Pin MAXIM Chip in the socket. Normal Anti-Static procedures should be followed.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Assembly/Disassembly Procedures

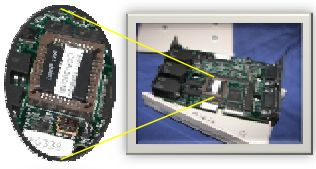
System Reset Jumper J13 – Shorting and then powering with reset all functions to Factory Defaults. Use only at direction of Benson Technical Support. Normal Anti-Static procedures should be followed.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Assembly/Disassembly Procedures

CCA-200mini Firmware Version 6.00 or higher. Replace only at direction of Benson Technical Support and with power off. Normal Anti-Static procedures should be followed.

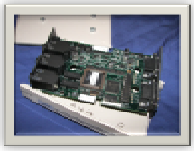


Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  III. Assembly/Disassembly Procedures

Reassembly should be done carefully so alignment of end plates are checked to avoid damage or breakage to the case. Normal Anti-Static procedures should be followed.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure

1. Exhaustive
   1. Manual
   2. Automatic
2. Annual
3. Daily Calibration Check
4. Functional Check



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure

All functions for calibration and maintenance are accessed through Menu Items when the Calibration Key is available as the Benson System Software is started…



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual

Manual Exhaustive Calibration can be accessed from the "Audiometer" Menu. Any Sound Level Meter / Audiometer Analyzer may be used. The Procedure vary depending on the System used.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual

Selection of Manual Audiometer Calibration will yield the Annual Calibration Menu:

The Serial Number, Calibration Date, Last Calibration Date, and Firmware Version will be displayed.

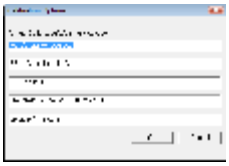


Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual

Selection of Calibration Options:

The Annual Calibration Warning can be entered to direct your sites to contact you for Annual Calibration. The period prior to warning is set in System Setup – General Tab



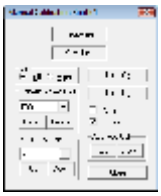
Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual

Selection of Calibration Options:

The Manual Calibration Booth n provides manual control to the Audiometer and Adjustment of the Acoustic Cal levels for the selected frequency.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual

Selection of Calibration Control Options:

Control of Frequency and Output is completed by using drop down menus or typing the desired output…



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual

Selection of Calibration Control Options:

Control of Frequency and Output is completed by using the combo boxes to select the desired output…



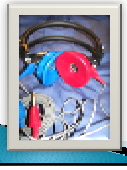
Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual
  1. Procedural Order – Exhaustive Calibration
     1. Visual Inspection
     2. Acoustical Levels
     3. Frequency
     4. Distortion
     5. Rise / Fall Times
     6. On / Off
     7. Crosstalk
     8. Linearity

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual
  1. Procedural Order – Exhaustive Calibration
     1. Visual Inspection
        1. Inspect Case for any crack or breakage.
        2. Inspect Headset for any damage or frayed cords, loose set screws, or damaged ¼" phone plugs
        3. Check condition of MX51 Ear Cushions
        4. Check Headband for wear or loose headphone yokes



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual
  1. Procedural Order – Exhaustive Calibration
     1. Visual Inspection
        1. Inspect Case for any crack or breakage.







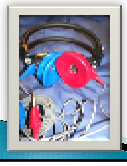




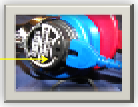
Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual
  1. Procedural Order – Exhaustive Calibration
     1. Visual Inspection
        2. Inspect Headset for any damage or frayed cords, loose set screws, or damaged ¼" phone plugs

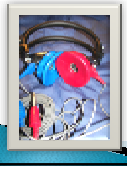


.035" Allen Head Set Screw



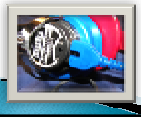
Audiometer Technical Training Course

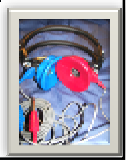
- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual
  1. Procedural Order – Exhaustive Calibration
     1. Visual Inspection
        3. Check condition of MX51 Ear Cushions
           i. White or Caulk-Like Residue – Replace
           ii. Cracks or Tears – Replace
           iii. Flattened or deformed shape – Replace



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual
  1. Procedural Order – Exhaustive Calibration
     1. Visual Inspection
        4. Check Headband for wear or loose headphone yokes
           i. Loose Vertical Post – Replace
           ii. Loose Yoke – Tighten or Replace
           iii. Worn or Broken Pins – Replace





Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual

1. Procedural Order – Exhaustive Calibration
   2. Acoustical Levels
      i. Left Ear – Pre-Calibration Level
      ii. Left Ear – Post-Calibration Level
      iii. Right Ear – Pre-Calibration Level
      iv. Left Ear – Post-Calibration Level



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual

1. Procedural Order – Exhaustive Calibration
   3. Frequency
      i. Measure Left Ear
      ii. 3% Maximum – 1 Hz Typical



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual

1. Procedural Order – Exhaustive Calibration
   4. Distortion
      i. All Frequencies
      ii. Left Ear –30db Maximum –42dB Typical
      iii. Right Ear –30db Maximum –42dB Typical



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual

1. Procedural Order – Exhaustive Calibration
   5. Rise / Fall Times
      i. 1KHz – Rise 20-50mS
      ii. 1KHz – Fall 20-50mS
      iii. 4KHz – Rise 20-50mS
      iv. 4KHz – Fall 20-50mS



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual

1. Procedural Order – Exhaustive Calibration
   6. On / Off
      i. Left Reference – Max Output
      ii. Measure Left – No Tone



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual

1. Procedural Order – Exhaustive Calibration
   7. Crosstalk
      i. Left Reference – Max Output
      ii. Measure Left with Max Output Right



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Manual

1. Procedural Order – Exhaustive Calibration
   8. Linearity
      i. Reference 70dBHL
      ii. Measure up to 100dBHL
      iii. Measure down to limit of SLM
      iv. Record incremental changes each step



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
      2. Aussco ACS100 System





Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Direct Support in Benson CCA-200 Software
         2. 7-10 Minute Calibration
            1. Report to printer
            2. Produce pdf file

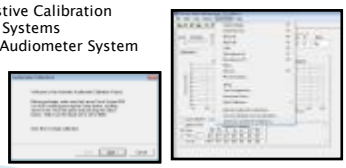


Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Menu Driven



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Identify Audiometer Serial Number
         2. Indicate LD824 Port
         3. Enter Microphone Corrections
         4. Next…



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Identify Microphone
         2. Identify Serial Number
         3. Calibration Dates



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
    1. Automatic Calibration Systems
        1. Larson Davis 824 Audiometer System
            1. Identify Technician Information
            2. Identify Facility Information



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
    1. Automatic Calibration Systems
        1. Larson Davis 824 Audiometer System
            1. Calibration Test Options
                1. Acoustic
                    1. Used for Pre-Cal Data
                2. Run All
                    1. Complete Exhaustive Cal
                    2. Switch Ears at Prompts



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
    1. Automatic Calibration Systems
        1. Larson Davis 824 Audiometer System
            1. Select Pre-Cal
            2. Click OK



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Select Both Earphones
         2. Place Left Phone on Coupler
         3. Click OK



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Pre-Cal Measurement will start
         2. Target is 70.0 dBHL



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Warning indicates measurement outside +/- 3.0 dB
         2. Place Right Phone and Click OK



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. The Right Phone will process
         2. On completion place Left Phone on coupler.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Confirm Left Phone on Coupler
         2. Select Run All



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Select Both
         2. Click OK

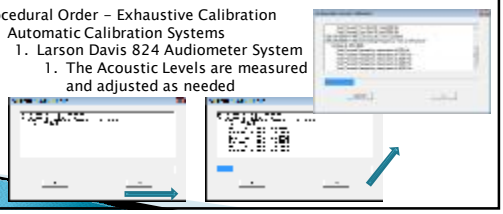


Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

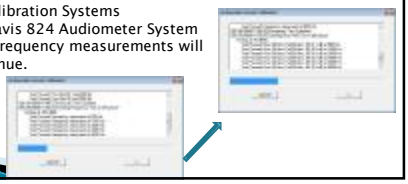
1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. The Acoustic Levels are measured and adjusted as needed



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. The Frequency measurements will continue.



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Rise / Fall Test is started next
         2. Rise / Fall / Overshoot are included



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

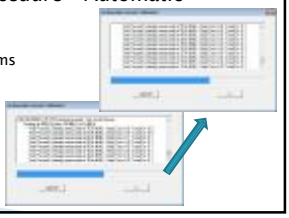
1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Distortion Test will queue next



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Linearity 70dBHL to 10dBHL Next
         2. Step Error
         3. Cumulative Error



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Linearity 70dBHL to 100dBHL Next
         2. Step Error
         3. Cumulative Error



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Left Phone On/Off Ratio is completed



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Place Right Phone on Coupler
         2. Click Ok to start Right Acoustic Measurements



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. Distortion Test is started



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
    1. Automatic Calibration Systems
        1. Larson Davis 824 Audiometer System
            1. Crosstalk Test will conclude the automated procedure



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
    1. Automatic Calibration Systems
        1. Larson Davis 824 Audiometer System
            1. Identify Left Phone Serial Number
            2. Identify Right Phone Serial Number



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
    1. Automatic Calibration Systems
        1. Larson Davis 824 Audiometer System
            1. Click Set Calibration Date
            2. Then Click Print for Printer
                1. If pdf is required Check Print to Screen

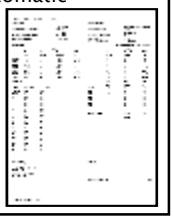


Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      1. Larson Davis 824 Audiometer System
         1. A Sample Calibration Report
         2. Click Finish to Complete Calibration





Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      2. Aussco ACS100 System



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      2. Aussco ACS100 System
         1. Opening Screen



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      2. Aussco ACS100 System
         1. Audiometer Selection



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      2. Aussco ACS100 System
         1. Test Setup Screen



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      2. Aussco ACS100 System
         1. Calibration Control



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      2. Aussco ACS100 System
         1. Headphone Output Test



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

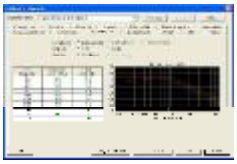
1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      2. Aussco ACS100 System
         1. Test Selection



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      2. Aussco ACS100 System
         1. Calibration Results



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      2. Aussco ACS100 System
         1. Sample Calibration Form



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Automatic

1. Procedural Order – Exhaustive Calibration
   1. Automatic Calibration Systems
      2. Aussco ACS100 System
         1. Automated Procedure for Multiple Audiometers
         2. Storage of previously calibrated instruments
         3. Sound Room Certification Option

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Annual

1. Procedural Order – Exhaustive Calibration
   1. Annual Calibration Procedure
      1. Audiometer calibration shall be checked acoustically, at least annually, according to the procedures described in this appendix. The equipment necessary to perform these measurements is a sound level meter, octave-band filter set, and a National Bureau of Standards 9A coupler. In making these measurements, the accuracy of the calibrating equipment shall be sufficient to determine that the audiometer is within the tolerances permitted by American Standard Specification for Audiometers, S3.6-1969.

Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Annual

1. Procedural Order – Exhaustive Calibration
   1. Annual Calibration Procedure
      1. "Sound Pressure Output Check"
         1. Place the earphone coupler over the microphone of the sound level meter and place the earphone on the coupler.
         2. Set the audiometer's hearing threshold level (HTL) dial to 70 dB.
         3. Measure the sound pressure level of the tones at each test frequency from 500 Hz through 6000 Hz for each earphone.
         4. At each frequency the readout on the sound level meter should correspond to the levels in Table E-1 or Table E-2, as appropriate, for the type of earphone, in the column entitled "sound level meter reading."

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Annual

1. Procedural Order – Exhaustive Calibration
   1. Annual Calibration Procedure
      1. "Linearity Check"
         1. With the earphone in place, set the frequency to 1000 Hz and the HTL dial on the audiometer to 70 dB.
         2. Measure the sound levels in the coupler at each 10-dB decrement from 70 dB to 10 dB, noting the sound level meter reading at each setting.
         3. For each 10 dB decrement on the audiometer the sound level meter should indicate a corresponding 10 dB decrease.
         4. This measurement may be made electrically with a voltmeter connected to the earphone terminals.

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Annual

1. Procedural Order – Exhaustive Calibration
   1. Annual Calibration Procedure
      1. "Tolerances"
         1. When any of the measured sound levels deviate from the levels in Table E-1 or Table E-2 by + or – 3 dB at any test frequency between 500 and 3000 Hz, 4 dB at 4000 Hz, or 5 dB at 6000 Hz, an exhaustive calibration is advised. An exhaustive calibration is required if the deviations are greater than 15 dB or greater at any test frequency.

Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Annual
  1. Procedural Order – Exhaustive Calibration
     1. Annual Calibration Procedure
        1. TABLE E-1 – REFERENCE THRESHOLD LEVELS FOR TELEPHONICS – TDH-39 EARPHONES

Reference threshold Sound level for level Frequency, Hz TDH-39 meter earphones, reading,

Frequency	dBSPL	dBSPL
500	11.5	81.5
1000	7.0	77.0
2000	9.0	79.0
3000	10.0	80.0
4000	9.5	79.5
6000	15.5	85.5

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Annual
  1. Procedural Order – Exhaustive Calibration
     1. Annual Calibration Procedure

Generally an Annual Calibration is not recommended as the time differential between the Exhaustive and Annual is minimal.

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Daily Calibration Check
  1. Procedural Order – Daily Calibration Check
     1. Functional Check
        1. Click Audiometer
        2. Select Functional Check



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

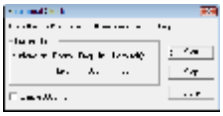
Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Daily Calibration Check
  1. Procedural Order – Daily Calibration Check
     1. Functional Check
        1. Press "Booth Response Switch" to start the check



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Daily Calibration Check
  1. Procedural Order – Daily Calibration Check
     1. Functional Check
        1. Functional Test Protocol Start Screen
           1. L500 60
           2. L1000 60
           3. L2000 60
           4. L3000 60
           5. L4000 60
           6. L6000 60
           7. R1000 70 to 0
           8. L1000 60



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Daily Calibration Check
  1. Procedural Order – Daily Calibration Check
     1. Daily Calibration
        1. Click Audiometer
        2. Select Daily Calibration
           1. Set
           2. Clear
           3. Save/Print
           4. Configuration



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Daily Calibration Check
  1. Procedural Order – Daily Calibration Check
     1. Daily Calibration
        1. Click Audiometer
        2. Select Daily Calibration
           1. Set
              1. Select desired Audiometer
              2. All Enabled for All



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Daily Calibration Check
  1. Procedural Order – Daily Calibration Check
     1. Daily Calibration
        1. Click Audiometer
        2. Select Daily Calibration
           2. Clear
              1. Select Audiometer
              2. All Enabled



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Daily Calibration Check
  1. Procedural Order – Daily Calibration Check
     1. Daily Calibration
        1. Click Audiometer
        2. Select Daily Calibration
           3. Save/Print
              3. Select Desired Audiometer





Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Daily Calibration Check

1. Procedural Order – Daily Calibration Check
   1. Daily Calibration
      1. Click Audiometer
      2. Select Daily Calibration
         3. Configuration
            1. Bio-Acoustic Simulator
            2. Bio-Acoustic Simulator w/8kHz
            3. Human Ear
            4. Human Ear w/8kHz



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Daily Calibration Check

1. Procedural Order – Daily Calibration Check
   1. Daily Calibration
      1. Click Audiometer
      2. Select Daily Calibration
         3. Configuration
            1. Bio-Acoustic Simulator
               2. General Screen



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Daily Calibration Check

1. Procedural Order – Daily Calibration Check
   1. Daily Calibration
      1. Click Audiometer
      2. Select Daily Calibration
         3. Configuration
            Bio-Acoustic Simulator
            Test Sequence



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Daily Calibration Check

1. Procedural Order – Daily Calibration Check
   2. Daily Calibration
      3. Click Audiometer
      4. Select Daily Calibration
         5. Configuration
            1. Bio-Acoustic Simulator Automatic Retest



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Daily Calibration Check

1. Procedural Order – Daily Calibration Check
   1. Daily Calibration
      1. Click Audiometer
      2. Select Daily Calibration
         3. Configuration
            1. Bio-Acoustic Simulator
               1. Wait Intervals



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Daily Calibration Check

1. Procedural Order – Daily Calibration Check
   1. Daily Calibration
      1. Set All Audiometers to Daily Calibration
      2. Click Start Icon



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Calibration Procedure – Daily Calibration Check

1. Procedural Order – Daily Calibration Check
   1. Daily Calibration
      1. Test Progression is displayed
      2. Status will be Testing
      3. At Test End transfer data to DOEHRS



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Troubleshooting

1. Audiometers will not connect…
   1. No USB CIC installed
   2. USB Port not functioning
   3. USB CIC Drivers not installed
   4. ???



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration
  Troubleshooting

1. Audiometer(s) will not connect
   1. Plug and Play (PNP) turned off
   2. Cabling not intact
   3. Serial Number Incorrect
   4. No power to USB CIC



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration Troubleshooting
  1. Audiometer(s) will not connect
     1. Plug and Play (PNP) turned off – insure the box is checked
     2. Serial Number Incorrect
     3. Cabling not intact
     4. No power to USB CIC



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration Troubleshooting
  1. Audiometer(s) will not connect
     1. Plug and Play (PNP) turned off – insure the box is checked
     2. Serial Number Incorrect
     3. Cabling not intact
     4. No power to USB CIC



Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration Troubleshooting
  1. Audiometer(s) will not connect
     1. Plug and Play (PNP) turned off – insure the box is checked
     2. Serial Number Incorrect
     3. Cabling not intact
     4. No power to USB CIC



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration Troubleshooting
  1. Multiple Response (MR) Errors
     1. Bad Handswitch



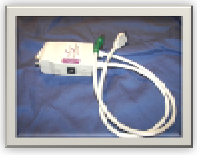
Audiometer Technical Training Course

- CCA-200mini Audiometer Calibration Questions & Answer Session



Audiometer Technical Training Course

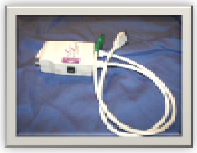
- USB Computer Interface Cable
  I. Theory of Operation
  II. Installation Procedures
  III. Assembly/Disassembly Procedures
  IV. Troubleshooting
  V. Question and Answer



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

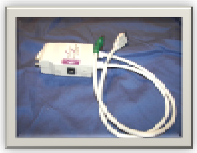
Audiometer Technical Training Course

- USB Computer Interface Cable
  - I. Theory of Operation
    - I. The USB CIC provides a standardized USB access to the DOEHRS-HC System PC.
    - II. The USB CIC provides power supply functions to the serial daisy-chain
    - III. The USB CIC provides instruction and talkover functions to the audiometers



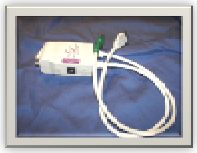
Audiometer Technical Training Course

- USB Computer Interface Cable
  - I. Theory of Operation
    - I. The USB CIC provides a standardized USB to Serial Access from the DOEHRS-HC System PC.
      - I. Meets USB 2.0 Full Speed Standards
      - II. Programmable for future Upgrade Compatibility



Audiometer Technical Training Course

- USB Computer Interface Cable
  - II. Installation Procedures
    - I. Plug to Available Cable from Audiometer Daisy Chain
    - II. Connect Green Audio Cable to Speaker Output Jack
    - III. Plug Power Supply Cord to USB CIC Jack
    - IV. Plug USB Plug to available USB Jack on DOEHRS-HC PC
    - V. Dress Cables to protect installation

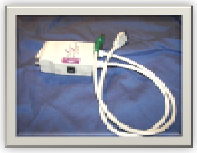


Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

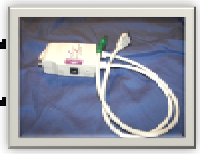
- USB Computer Interface Cable
  - III. Assembly/Disassembly Procedures
    - I. No User Serviceable Components are available in the USB CIC
    - II. Contact Benson Medical Instruments Company for Technical Support at:

      (612) 827-2222 Choice 5



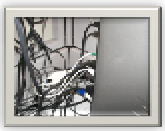
Audiometer Technical Training Course

- USB Computer Interface Cable
  - IV. Troubleshooting
    - I. Cable Connection Issues
      - I. All Connections Correct
    - II. Non Functioning USB Port
      - I. Check Device Manager on PC
        - I. Administrative Rights Needed
    - III. Missing Software Drivers
      - I. Check Device Manager on PC
        - I. Administrative Rights Needed
    - IV. Uninstalled Software Drivers

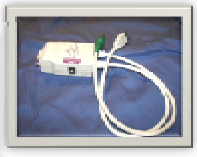


Audiometer Technical Training Course

- USB Computer Interface Cable
  - V. Question and Answer







Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- BAS-200 Simulator
  - I. Theory of Operation
  - II. Installation Procedures
  - III. Assembly/Disassembly Procedures
  - IV. Calibration Reference Setup
  - V. Troubleshooting
  - VI. Question and Answer



Audiometer Technical Training Course

- BAS-200 Simulator
  - I. Theory of Operation
    - I. Provide Referenced "Ear" for Daily Calibration Function
    - II. Serial Number Matched to CCA-200mini Audiometer in Benson Medical control software.
    - III. Provide Integrated Mounting Bracket for BAS-200 and CCA-200mini System



Audiometer Technical Training Course

- BAS-200 Simulator
  - I. Theory of Operation
    - I. Provide Referenced "Ear" for Daily Calibration Function
      - I. System Electronics designed to provide a "Reference Level" between 60 and 75dBHL.
      - II. Test Protocol software controlled to provide a test time of about 70 seconds
      - III. Color Coded Ear Cups to minimize placement errors



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- BAS-200 Simulator
  - I. Theory of Operation
  - II. Serial Number Matched to CCA-200mini Audiometer in Benson Medical control software
    - I. Audiometer matched to BAS-200 in System Setup for import to DOEHRS-HC
    - II. Reference Specific to Audiometer for better Daily Calibration Tracking.



Audiometer Technical Training Course

- BAS-200 Simulator
  - I. Theory of Operation
  - III. Provide Integrated Mounting Bracket for BAS-200 and CCA-200mini System
    - I. Creates a 6" x 6" x 6" Module for each Test Station.
    - II. Standard Cabling between BAS-200 and CCA-200mini – 6" ¼" Phone Cable.
    - III. Simple Handswitch insertion to ready for testing function.





Audiometer Technical Training Course

- BAS-200 Simulator
  - II. Installation Procedures
    - I. Mount BAS-200 Bracket
    - II. Install CCA-200mini Bracket
    - III. Install CCA-200mini Audiometer (See CCA-200mini Install Section)
    - IV. Place BAS-200 Simulator on Bracket
    - V. Install 6" ¼" Phone Cord from BAS-200 Simulator Audiometer Jack to CCA-200 Response Jack



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- BAS-200 Simulator
  - II. Installation Procedures
    - I. Mount BAS-200 Bracket





Audiometer Technical Training Course

- BAS-200 Simulator
  - II. Installation Procedures
    - II. Install CCA-200mini Bracket




Audiometer Technical Training Course

- BAS-200 Simulator
  - II. Installation Procedures
    - III. Install CCA-200mini Audiometer (See CCA-200mini Install Section)
      - I. Three Screws Holes punched in BAS-200 Bracket
      - II. Attach DB9 Cables to CCA-200mini



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- BAS-200 Simulator

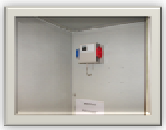
II. Installation Procedures

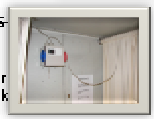
IV. Place BAS-200 Simulator on Bracket

I. Align BAS-200 and seat into the Bracket

II. Level BAS-200 to cover any issues with plumb of the BAS-200 Bracket

V. Install 6" ¼" Phone Cord from BAS-200 Simulator Audiometer Jack to CCA-200 Response Jack





Audiometer Technical Training Course

- BAS-200 Simulator

III. Assembly/Disassembly Procedures

I. The BAS-200 is disassembled by removing two screws from the back of the case.

II. Cabling Chris-Crosses internally from left to right and right to left.



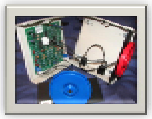


Audiometer Technical Training Course

- BAS-200 Simulator

III. Assembly/Disassembly Procedures

I. The BAS-200 has no user replaceable components on the circuit board. The wiring harness is keyed.







Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- BAS-200 Simulator
  - II. Installation Procedures
    - I. Mount BAS-200 Bracket
    - II. Install CCA-200mini Bracket
    - III. Install CCA-200mini Audiometer (See CCA-200mini Install Section)
    - IV. Place BAS-200 Simulator on Bracket
    - V. Install 6" ¼" Phone Cord from BAS-200 Simulator Audiometer Jack to CCA-200 Response Jack



Audiometer Technical Training Course

- BAS-200 Simulator
  - IV. Calibration Reference Setup
    - I. Setup for Daily Calibration
      - I. Audiometer – Daily Calibration
      - II. "Set"
      - III. "All Enabled Audiometers"
    - II. Start Test





Audiometer Technical Training Course

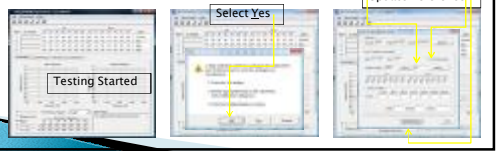
- BAS-200 Simulator
  - IV. Calibration Reference Setup
    - I. Setup for Daily Calibration
      - I. Headset Placed and Response Switch Removed – Power Light *ON*
    - II. Set Benson System for Daily Calibration
      - I. Audiometer – Daily Calibration
      - II. "Set"
      - III. "All Enabled Audiometers"
    - III. Start Test – "All Enabled Audiometers"



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- BAS-200 Simulator
  - IV. Calibration Reference Setup"
    - II. Start Test – "All Enabled Audiometers"
    - II. At Test Finish Follow Prompts



Audiometer Technical Training Course

- BAS-200 Simulator
  - IV. Troubleshooting
    - I. No Power Light
      - I. Response Switch Plugged in
      - II. Patch Cord to CCA-200min Unplugged
    - II. Daily Calibration Reference Error – Failed
      - I. Headset not seated correctly
      - II. Damaged or punctured microphone
      - III. Microphone Jack unplugged



Audiometer Technical Training Course

- BAS-200 Simulator
  - V. Question and Answer



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

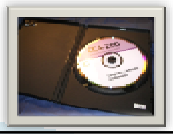
Audiometer Technical Training Course

- Software Systems Review
  - I. Software Specifications
    - I. The supplied software will control the audiometers with easy-to-use Windows® Certified software. The test and error instructions are delivered through headset in multiple languages. It can operate up to 16 test stations.
    - II. The software is the standard CCA-200mini software. Essential operation is described in a Operations Manual found in Appendix A.



Audiometer Technical Training Course

- Software Systems Review
  - II. Theory of Operation
    - I. The CCA-200mini DOEHRS-HC System provides a standard Window® Interface allowing for a quick learning curve. The Version 6.2x provides system enhancements and bug corrections over the current Version 4.3x currently installed.





Audiometer Technical Training Course

- Software Systems Review
  - II. Theory of Operation
    - II. The following changes have been made as requested by the Contract:
      - I. Windows Logo certification
      - II. Add Korean and Arabic languages
      - III. Add Single ear test configurations
      - IV. Accept all threshold on Assign
      - V. Add Auto-retest if >= +-10 dB @ 2,3,4k
      - VI. Add Calibration Routines protected by password
      - VII. Remove daily calibration print function
      - VIII. Add Simulator Information Return



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- Software Systems Review

II. Theory of Operation

II. The following methods can be used for Function and Menu selection in the System:
  I. Windows® Point & Click Selection
    I. Hover Function will show selection options
  II. Windows® Dropdown Menus
  III. Keyboard Function Keys



Audiometer Technical Training Course

- Software Systems Review

II. Theory of Operation

II. The following methods can be used for Function and Menu selection in the System:
  I. Windows® Point & Click Selection
    I. Hover Function will show selection options
  II. Windows® Dropdown Menus
  III. Keyboard Function Keys



Audiometer Technical Training Course

- Software Systems Review

II. Theory of Operation

II. The following methods can be used for Function and Menu selection in the System:
  I. Windows® Point & Click Selection
    I. Hover Function will show selection options
  II. Windows® Dropdown Menus
  III. Keyboard Function Keys



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- Software Systems Review
  - III. Installation Procedures
    - I. Place the CD in the DoD Computer – Login by an Administrative Level Login – and allow the installation to start. If AutoPlay does not start then browse to CD Location and double click Setup.exe (Application)



Audiometer Technical Training Course

- Software Systems Review
  - III. Installation Procedures
    - II. Follow Installation Screens – a clean (new) install will show the following screen, while a previously installed system will Recommend an upgrade. The install shown is an MS XP sp2 install.



Audiometer Technical Training Course

- Software Systems Review
  - III. Installation Procedures
    - III. Select Default Locations for system installation



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- Software Systems Review
  - III. Installation Procedures
    - IV. Select DOHRS-HC as the database interface. This will create all required test configurations and setups.



Audiometer Technical Training Course

- Software Systems Review
  - III. Installation Procedures
    - V. Select Default Benson Medical Instruments folder in the program folder.



Audiometer Technical Training Course

- Software Systems Review
  - III. Installation Procedures
    - VII. The following are a sampling of the screens that appear during the installation process.

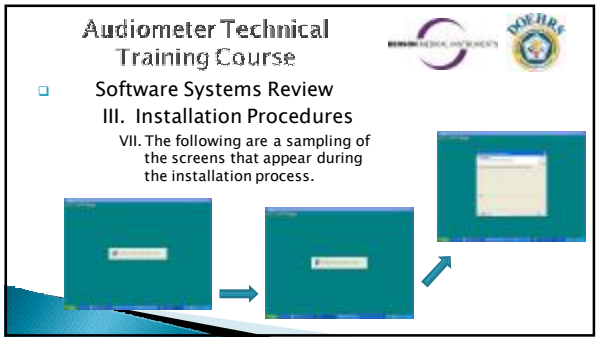


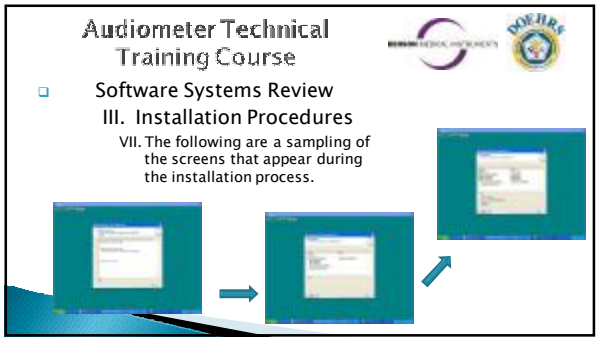


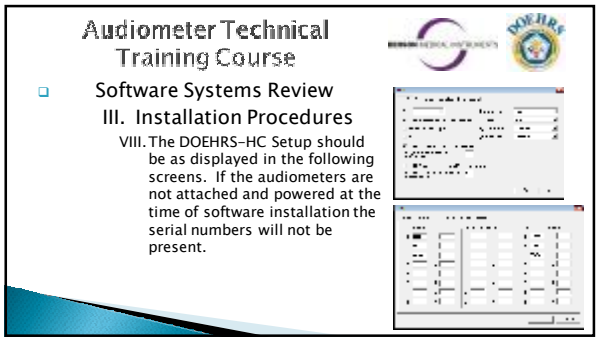


Click OK to confirm that the Hardware Key is not installed (None is required for DOEHRS-HC Operation

Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide


Audiometer Technical
Training Course
Software Systems Review
III. Installation Procedures
VII. The following are a sampling of the screens that appear during the installation process.


Audiometer Technical
Training Course
Software Systems Review
III. Installation Procedures
VII. The following are a sampling of the screens that appear during the installation process.


Audiometer Technical
Training Course
Software Systems Review
III. Installation Procedures
VIII. The DOEHRS-HC Setup should be as displayed in the following screens. If the audiometers are not attached and powered at the time of software installation the serial numbers will not be present.

Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- Software Systems Review

III. Installation Procedures

IX. After audiometers are installed the serial number will be populated, *if any Audiometer serial number did not Plug and Play (PNP) then Tech Support needs to be notified and at their direction the Audiometer replaced.*



Audiometer Technical Training Course

- Software Systems Review

III. Installation Procedures

IX. However, BAS-200 Simulator Serial Numbers need to be added manually. This is required so the Simulator Data can be transferred to the DOEHRS-HC System and allow for proper Form 2217 capture.



Audiometer Technical Training Course

- Software Systems Review

III. Installation Procedures

x. The configurations shown at the right are the standard DOEHS-HC Test Options:

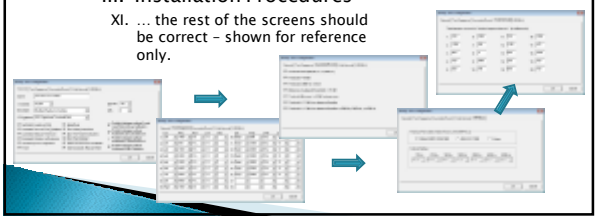
xi. If the screen at the right is shown, then DOEHRS-HC has installed properly and the rest of the screens should be correct – shown for reference only.



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- Software Systems Review
  III. Installation Procedures
  XI. … the rest of the screens should be correct – shown for reference only.



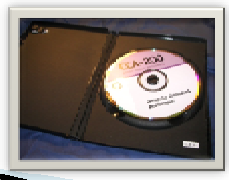
Audiometer Technical Training Course

- Software Systems Review
  IV. Troubleshooting
  I. Screen Print any errors and paste to a Word Document for submission to Benson Medical Technical Support
  II. For Software Installation Issues Contact:

Benson Medical Instruments Co.
(612) 827-2222 choice 5
dmayou@bensonmedical.com

Audiometer Technical Training Course

- Software Systems Review
  V. Question and Answer





Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- Computer System Review
  - I. System Specifications
    - I. **Hardware Requirements**
      - I. The audiometer software requires an IBM PC-compatible computer with a 1 GHz or higher processor running Microsoft Windows® XP SP2, 2000 SP4, or Vista; minimum 256 megabytes
      - II. (2000/XP) or 1 GB (Vista) RAM; and 500 megabytes free hard drive. Talk-over and voice instructions: SoundBlaster 16 or 100% compatible full-duplex sound card and microphone are required.
      - III. For the CCA-200mini, one free USB port is required.
      - IV. ALL DoD Dell OptiPlex Systems meet the above requirements



Audiometer Technical Training Course

- Computer System Review
  - II. Installation Procedures
    - I. Contact Local Information Services for PC related issues.



Audiometer Technical Training Course

- Computer System Review
  - III. Troubleshooting
    - I. The only known issue is on Air Force OptiPlex 745
      - I. If after reviewing the Volume Control Properties, the record functions are grayed out – a driver update is required. Contact Benson Medical Technical Support for additional information or log on to Dell's Support with Service Tag Number to access the driver download site.



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Audiometer Technical Training Course

- Computer System Review
  V. Question and Answer



Audiometer Technical Training Course

- Examination



Audiometer Technical Training Course

- Support & Contact Information
  - Benson Medical Instrument Co.
    - 310 Fourth Avenue South, Suite 5000
    - Minneapolis, MN 55415 USA
    - (612) 827-2222 Choice 5
    - dmayou@bensonmedical.com
  - SRMi Consulting, LLC
    - PO Box 190
    - Mountain, WI 54149 USA
    - (715) 276-2947 Voice or TTY
    - (715) 850-1568 Cell - 24/7
    - service@srmi.com



Copyright 2008 – SRMi Consulting, LLC
All Rights Reserved Worldwide

Copyright 2008 SRMi Consulting, LLC

Audiometer Technical Training Course



CCA-200 / BAS-200 Operator's Manual

System Support and Service

Benson Medical Instruments Co.

CCA-200mini / BAS-200 Audiometric System

DOEHRS-HC Audiometer Refresh

SRMi Consulting, LLC

Lindor "Skip" Maletzke

(715) 276-2947

(715) 850-1568 Cell 24/7

skipm@srmi.com

Copyright 2008 SRMi Consulting, LLC

This Page is blank

Copyright 2008 SRMi Consulting, LLC

User's Manual

CCA-200*mini*

and

CCA-200

Version 6.20

Benson Medical Instruments Co.

©1996-2008

Table Of Contents

Audiometer Installation and Setup 1

Audiometer Installation and Setup 1
Hardware Requirements 1
Installation Checklist 1
Installing the Software on your Hard Disk 1
Uninstalling the Software 2
Starting the Software 2
Plug and Play Installation 2
Installing the Audiometer 3
Two Versions of the Audiometer 3
Single-Station Installation of the CCA-200 3
Multi-Station Installation of the CCA-200 6
Single-Station Installation of the CCA-200mini 8
Multi-Station Installation of the CCA-200mini 10
Wall Mounting 12
Initial Administrator Log-In and Setup 12
Database Password and Windows Security 13
Audiometer Setup 14
Database Interfaces 15
Setting Up the Audiometer 16
Volume for Instructions and Microphone 17
Changing Configurations 17
Plug and Play Configuration 17
Manual Configuration (non-Plug and Play) 17

Plus Package Installation 19

Installing the Plus Package 19

Bio-Acoustic Simulator Installation 21

Installing the Bio-Acoustic Simulator 21
Installing the BAS-200 with the CCA-200 21
Installing the BAS-200 with the CCA-200mini 23

BAS-200slm and SLM-200 Installation 27

Installing the BAS-200slm or SLM-200 27
Installing the BAS-200slm with the CCA-200 27
Installing the BAS-200slm with the CCA-200mini 29
Installing the SLM-200 with the CCA-200 32
Configuring the Sound Level Meter 34

Bracket 35

Bracket for BAS-200 or BAS-200slm with CCA-200mini 35
Installation of Bracket on Wall 35
Installation of Audiometer in Bracket 36
Installation of BAS-200 or BAS-200slm in Bracket 36

©1996-2008 Benson Medical Instruments Co.

Copyright 2008 SRMi Consulting, LLC

Cabling of Equipment in Bracket 37
User Passwords and Multi-User Installation 39
User Names and User Passwords 39
User Access Levels 39
Adding Users 40
Modifying Users 41
Deleting Users 41
Multi-User Installation 41
Viewing the Work of Other Users 42
Error Log 43
Error Log 43
User's Manual PDF File 45
Printed Documentation 45
Control Window 47
Control Window 47
Menu Functions 47
Daily Calibration Submenu 50
Toolbar 51
Tool Tips 52
Delete All 52
Individual and Group Control 53
Enabling an Audiometer 53
Audiometer Context Menu 53
Audiometer Control Functions 53
Instructions for Mouse and Keyboard 55
Test Display 57
Audiometer Information Tabs 59
Information Tab Fields 59
Audiogram Graph 61
Viewing Information Tabs 61
Automatic Testing 63
Standard Test Configurations 63
Test Configuration Dialog Box 63
General Tab (Test Configuration) 63
Languages for Voice Instructions 63
Threshold Determination 64
Real-Time STS Calculation 65
Automatic Assign, Save, and Clear check boxes 65
Variable Starting Level 65
Terminate Stimulus on Response (TSOR) 66
Initial Response Confirmation 66
Pulse and Continuous Stimulus 66
Keep Busy 66

Copyright 2008 SRMi Consulting, LLC

Start Test Voice Instructions 67
Error Handling 67
Error Descriptions 68
Playing Voice Instructions 69
Stop Test on Error 69
Retest on Noise Above MPANL 69
Semi-Automatic Manual Mode 70
Prohibit Audiogram without Sound Level Meter Calibration 70
Prohibit Audiogram without Annual Calibration 71
Prohibit Audiogram without Functional Check 71
Prohibit Audiogram without Daily Calibration 71
Test Sequence Tab (Test Configuration) 71
Historical Starting Level (HSL) 72
Programmed Retests 72
Automatic Retests 73
Wait Intervals 73
MPANLs 73
Choosing an Automatic Test Configuration 74
Adding an Automatic Test Configuration 74
Modifying an Automatic Test Configuration 75
Deleting an Automatic Test Configuration 75

Manual Testing 77

Manual Testing 77

Daily Calibration Check 79

Daily Calibration 79
Daily Calibration Configuration 79
Daily Calibration Check using the Bio-Acoustic Simulator 80
Save/Print Daily Calibration dialog box 80
Printing a Daily Calibration Report 82
Updating the Daily Calibration Reference Test 82
Daily Calibration Save/Print Options 83

Functional Check 85

Audiometer Functional Check 85
Functional Check Sequence 85
Functional Check Procedure 86

Languages 87

Languages 87
Adding a Language 88
Modifying a Language 88
Deleting a Language 89

Testing, Saving, and Printing with STORAGE 91

Performing an Audiogram 91
Assigning a Subject 91

Copyright 2008 SRMi Consulting, LLC

Verifying Correct Audiometer Setup 92
Beginning Automatic Testing 92
Saving an Audiogram 93
Printing an Audiogram 94
Save/Print Options 94
Multiple Report Print Options 95
Add Multiple Report Print dialog box 95
Adding a Report for Multiple Report Print 96
Modifying a Report for Multiple Report Print 96
Deleting a Report for Multiple Report Print 97
Revising a Baseline Manually 97

STORAGE/PLUS PACKAGE 99

Storage/Plus Package 99
Storage/Plus Package Features 99

Database View 101

Split Screen 101
Database View 101
Subject View 102
Subject Context Menu 102
Audiograms Page 102
Audiogram Context Menu 102
Histories Tab 103
History Context Menu 103
Viewing Audiograms (and Histories with Plus Package) 103

Companies 105

Companies 105
Viewing Companies 106
Company Settings 106
Calculate STS Using Age Correction check box 106
Automatic Baseline Revision 106
Separate Left/Right Baselines 107
Retest Period 107
NR Substitution (dB) 107
Regulation 108
Subject ID Format 108
Changing the Subject ID Format 109
Adding a Company 110
Modifying a Company 111
Deleting a Company 111
Duplicating a Company 112

Subjects 113

Subjects 113
Add Subject Dialog Box 113
Find Subject Dialog Box 114

Copyright 2008 SRMi Consulting, LLC

Viewing Subjects 115
Adding a Subject 115
Modifying a Subject 116
Deleting a Subject 116
Finding a Subject 117
Moving a Subject to a Different Company 117
Combining Two Subjects in Different Companies 118
Combining Two Subjects in the Same Company 119

Audiograms and Histories 121

Audiograms 121
Refer Subject data field 121
Reject Audiogram check box 121
Sound Level Meter group box 122
STS Calculation 122
Adding an Audiogram 122
Modifying an Audiogram 123
Deleting an Audiogram 123
Subject History 124
Subject History Questionnaire 125
User-Defined Questions for Subject History 126
Entering Responses to History Questions 126
Default Responses to History Questions 127
Adding a History 128
Modifying a History 128
Deleting a History 129

Analysis 131

Audiogram Analysis Columns 131
Scale of Hearing Impairment 132
OSHA STS Baseline and MSHA STS Baseline 132
OSHA Recordable Shift & MSHA Reportable Shift 133
OSHA Recordable / MSHA Reportable Shift Baseline 133
Annual Not Used 134
Better 134
First Test 134
Improvement 134
Improvement, Persistent Improvement 135
Improvement, < 6 Month 135
Missing or Invalid Data 135
Much Better 136
Much Worse 136
No Change 136
Persistent Improvement 136
Persistent STS 136
Recordable STS 137
Recordable STS Lined Out 137

Copyright 2008 SRMi Consulting, LLC

Rejected Test Data 137
Repealed Recordable STS 137
Repealed Reportable 138
Repealed STS 138
Reportable Hearing Loss 138
Retest Not Used 138
STS 138
STS, Persistent Improvement 139
STS, Persistent STS 139
STS, < 6 Month 139
Worse 140
Sound Level Meter Columns 140
NL Columns 140
AN Status Column 140
MPANL Columns 141

Daily Calibration Storage 143

Daily Calibration Storage 143
Daily Calibration Dialog Box 143
Add Audiometer Dialog Box 144
Adding an Audiometer 144
Modifying an Audiometer 144
Deleting an Audiometer 145
Daily Calibration Audiogram Dialog Box 146
Adding a Daily Calibration Audiogram 147
Modifying a Daily Calibration Audiogram 147
Deleting a Daily Calibration Audiogram 148
Updating the Daily Calibration Reference Test 148
Daily Calibration Reports 149
Daily Calibration Certificate report 150
Daily Calibration Summary report 150
Daily Calibration List report 151
Print Daily Calibration Report Dialog Box 151
Printing a Daily Calibration Report 152

Reports 153

Reports 153
Baseline Codes in Reports 154
Printing a Report 155
Medical Referral 155

Report Templates: Subject Reports 157

Subject Averages and Impairments 157
Subject History Questionnaire Report 157
Subject Notification Letter 157
Notification Letter Dialog Box 158
Modifying the Notification Letter 159
Subject History Report 159

Copyright 2008 SRMi Consulting, LLC

Subject Summary 159
Subject Test..... 160
Subject Test STS..... 160
Report Templates: Company Reports 161
All Company List..... 161
Company Baseline Revision List 161
Company Exception List..... 161
Company Medical Referral List..... 161
Company Recordable Reportable Shift List..... 161
Company Recordable Shift Line Out List..... 162
Company Roster..... 162
Company Retest List 162
Company STS Exception List..... 162
Company STS List..... 162
Company Summary..... 162
Company Test Schedule List..... 163
Report Select/Sorts 165
Select/Sorts 165
Report Selection Criteria 165
Report Options 169
Report Options 169
Custom Reports..... 169
Adding a Report: An Overview 170
Modifying a Report: An Overview 170
Adding a Report Template..... 172
Modifying a Report Template..... 172
Deleting a Report Template..... 173
Custom Select/Sorts..... 174
Adding a Select/Sort..... 174
Modifying a Select/Sort..... 174
Deleting a Select/Sort..... 175
SQL Syntax Functions 177
SQL Syntax Functions..... 177
The ASK() Function 177
The ASKSYS() Function..... 177
The ASKEX() Function 178
Backup and Restore 183
Backing Up Records: An Overview..... 183
Backing Up Records..... 184
Restoring Records: An Overview..... 184
Restoring Records..... 185
Extract and Merge 187
Extracting Records: An Overview 187

Copyright 2008 SRMi Consulting, LLC

Extract Dialog Box 187
Extracting Records 188
Extract Configurations 188
Pre-Defined Extract Configurations 188
Custom Extract Configurations 189
Adding an Extract Configuration 190
Modifying an Extract Configuration 190
Deleting an Extract Configuration 191
Duplicating an Extract Configuration 191
Extract/Merge Record Groups: A Diagram 191
Merging Records: An Overview 192
Merge Dialog Box 193
Merging Records: Procedure 193
Merge Configurations 194
Pre-Defined Merge Configurations 194
Custom Merge Configurations 195
Adding a Merge Configuration 196
Modifying a Merge Configuration 197
Deleting a Merge Configuration 197
Duplicating a Merge Configuration 197

Import and Export 199

Import Overview 199
Validation of Imported Data 200
Importing Data 200
Export Overview 201
Exporting Data 201
Functions Performed during Import/Export 201
Database Field Definitions 202
Formats for Importing and Exporting 207
Systoc Export 207
Custom Formats 209
Add Format Dialog Box 210
Fields in Import/Export Formats 211
Field Mapping 212
Re-formatting a Field 212
ASCII and Database Fields of Different Sizes 213
Bitmapped Field 214
Leading and Trailing Spaces 215
Export-Only Fields 215
Using Field Mapping 215
Adding a Format 216
Modifying a Format 217
Deleting a Format 217
Duplicating a Format 217
Adding a Field 218
Modifying a Field in an Import/Export Format 218

Copyright 2008 SRMi Consulting, LLC

Deleting a Field 219
Export Filters 219
Adding a Filter 220
Modifying a Filter 220
Deleting a Filter 220
User-Defined Fields 223
User-Defined Data Fields 223
Data Field Settings 223
Modifying a Data Field 223
Look-up Boxes 224
Field Prompt 224
Field Default 225
Real-Time Formatting 225
Data Validation for User-Defined Fields 225
Format Validation 226
Lock to List Validation 226
Legal Character Validation 227
Adding Format Validation to a Field 227
Adding Lock to List Validation to a Field 228
Adding Legal Character Validation to a Field 228
Disabling Data Validation for a Field 229
Data Transfer 231
Data Transfer 231
Data Transfer between Benson Medical Products 232
Data Transfer Using a Third-Party Database 232
Data Transfer Using RA 500 Protocol 233
Batch Transfer Using RA 500 Protocol 234
Third-Party Databases 234
DOHRS-HC 234
FOSHM 235
Hear Trak (DOS) 235
HearTrak (Windows) 235
Medgate 236
OHM 236
Systoc 236
Sound Level Meter 239
Sound Level Meter 239
Sound Level Meter Information Tab 239
Sound Level Meter Annual Calibration 240
Sound Level Meter Calibration Warning 241
STS Definitions 243
Standard Threshold Shift (STS) 243
Standard Threshold Shift with Age Correction 243
DOD Significant Threshold Shift 243

Copyright 2008 SRMi Consulting, LLC

Cleaning 245

Cleaning 245
Specifications 247

Audiometer Specifications 247
Trademarks 249

Trademark Information 249
Warranty 251

Warranty 251
Annual Calibration 253

Annual Calibration of the Audiometer 253
Access to Annual Calibration Routines 253
Installing the Annual Calibration Hardware Key 253
Requirements for Annual Calibration 254
Requirements for Exhaustive (2-Year) Calibration 254
Automatic Annual Calibration 254
Automatic Annual Calibration Procedure 255
Saving the Annual Calibration Report 256
Manual Annual Calibration 257
Calibration Options 257
Annual Calibration Warning 258
Abbreviations 259

Abbreviations 259
Index 261

Copyright 2008 SRMi Consulting, LLC

Audiometer Installation and Setup

Audiometer Installation and Setup

Installation of your audiometer is done in two parts. In the first part you will install the application software and choose the program settings. In the second part, you will install the hardware in your computer.

The audiometer is a Plug and Play device. With a Plug and Play operating system (e.g., MS Windows 2000), the audiometer can be installed automatically.

The first person to run the PC software will set up passwords for program access. This person should therefore be the program administrator.

Hardware Requirements

The audiometer software requires an IBM PC-compatible computer with a 1 GHz or higher processor running Microsoft Windows® XP SP2, 2000 SP4, or Vista; minimum 256 megabytes (2000/XP) or 1 GB (Vista) RAM; and 500 megabytes free hard drive. Talk-over and voice instructions: SoundBlaster 16 or 100% compatible full-duplex sound card and microphone are required.

For the CCA-200mini, one free USB port is required.

For the CCA-200, one free serial port or USB-to-serial adapter is required.

For the Plus Package, a parallel port or additional USB port is required.

Installation Checklist

- Install the audiometer software.
- Install the audiometer(s).
- Set up the Administrator user (and security measures available with the Plus Package, if applicable). See Initial Administrator Log-In and Setup .
- (Plus Package only:) If you are going to have multiple users of the software on different computers, install the software on the other users' computers. See Multi-User Installation .
- Set up any other users with passwords. See User Names and User Passwords.

Installing the Software on your Hard Disk

To install the audiometer software:

1. Insert the Audiometer Software CD in your computer's drive.
   If AutoPlay is enabled, the installation program will begin automatically. Follow the instructions on your screen.

Copyright 2008 SRMi Consulting, LLC

If AutoPlay does not function:

1. Choose Add/Remove Programs from the Control Panel.
2. Click the Install push button.
   Windows will find the install program and display the command line.
3. Follow the instructions on your screen to complete the installation.
   The installation will ask which database interface to select. If unsure, choose the default; you can choose a Database Interface later during initial program setup.

Uninstalling the Software

If you wish to uninstall the Benson Medical Instruments software and other possibly related components, you must uninstall all of the following items using the Add or Remove Programs applet:

- the Benson Medical Instruments software you currently use (such as CCA-200 or Solo)
- the Microsoft SQL Server 2005 instance with the following name: BMIMSDESERVER (see further instructions below)
- Sentinel Protection Installer

In order to find the Microsoft SQL Server 2005 instance called BMIMSDESERVER, go to the Add or Remove Programs applet and select Microsoft SQL Server 2005. Click Remove, and a wizard will appear, enabling you to select the instance called BMIMSDESERVER and remove it.

Starting the Software

Start the audiometer software under Programs in the Windows Start menu, or double-click the icon on the desktop.

By default, there is no password for the administrator; therefore leave the password edit box blank and choose OK to enter the program.

Plug and Play Installation

For the CCA-200mini:

To install the audiometer automatically:

1. With the computer still on, plug the USB CIC into the computer.
2. Make sure everything is cabled correctly.
   Detailed instructions are in the section Installing the Audiometer.
3. Go to the Device Manager, and find the entry for Computer Controlled Audiometer (it will be preceded by the icon of a question mark).
4. Right-click on that entry and choose Update Driver.

Copyright 2008 SRMi Consulting, LLC

5. Insert the CD-ROM in the drive.
6. Select the "Driver from disk provided by hardware manufacturer" radio button and choose OK.
   Windows 2000, XP, and Vista will copy files to your hard disk.

For the CCA-200:

To install the audiometer automatically:

1. With the computer off, connect the audiometer to the computer.
   Detailed instructions are in the section Installing the Audiometer.
2. Turn on the computer.
3. Go to the Device Manager, and find the entry for Computer Controlled Audiometer (it will be preceded by the icon of a question mark).
4. Right-click on that entry and choose Update Driver.
5. Insert the CD-ROM in the drive.
6. Select the "Driver from disk provided by hardware manufacturer" radio button and choose OK.
   Windows 2000, XP, and Vista will copy files to your hard disk.

Installing the Audiometer

The audiometer is a compact instrument. Because of its small size, it may be mounted inside or outside a sound booth, and sit either on a table or shelf or be mounted on any surface with the optional mounting bracket.

Up to ten audiometer stations can be operated with the power supply provided. For powering more than ten stations, contact your Benson Medical Instruments dealer. The audiometer operates on 90-250VAC 47-63Hz power. All control of the audiometers for up to sixteen stations is accomplished through a single RS-232C serial port.

Two Versions of the Audiometer

There are two versions of the 200 series audiometer: the CCA-200 and the CCA-200mini. See the following sections for installation instructions for each audiometer.

Single-Station Installation of the CCA-200

To install a single station of the CCA-200 audiometer, refer to the diagram and key to diagram numbers below. The diagram shows the CCA-200 audiometer installed with the BAS-200 Bio-Acoustic Simulator.

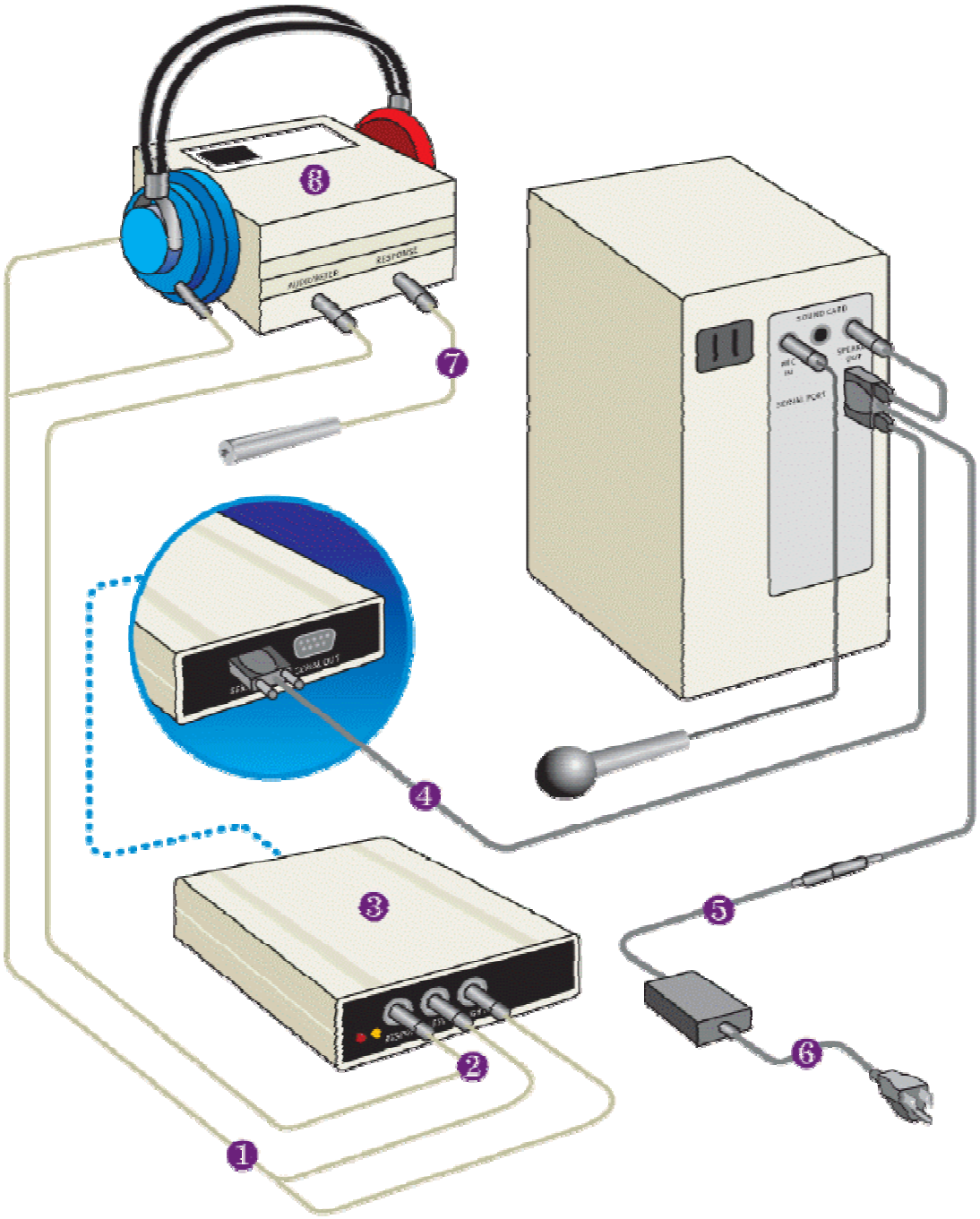
For complete instructions on simulator installation, see Installing the BAS-200 with the CCA-200.

Copyright 2008 SRMi Consulting, LLC

To install a single station of the CCA-200 audiometer:

1. If you are making changes to an existing installation, unplug the power supply cord from the wall outlet.
2. Connect the computer interface cable to the connector marked SERIAL IN on the audiometer.
3. Connect the other end of the computer interface cable to the serial port connector on the computer.
4. Connect the power supply output connector to the mating jack on the computer interface cable.
5. Connect the response switch as appropriate for either a daily calibration check or testing.
   If a simulator is not installed, connect the response switch to the RESPONSE jack on the audiometer.
   If a simulator is installed:
   For daily calibration checks, the response switch should not be connected to the Bio-Acoustic Simulator.
   For subject testing, the response switch is inserted into the RESPONSE jack of the Bio-Acoustic Simulator.
   If the audiometer is mounted outside the station, use standard patch cords to make connections through the station walls. There should be no need to modify the station.
6. Connect the remaining connector of the computer interface cable to the SPEAKER OUT connector on the PC sound card.
   Carefully check the connector labels on the sound card as many connections use the same type of connector.
   Do not confuse Line In with Line Out. Unless otherwise documented, assume that a jack marked Line refers to Line In.
7. Connect the microphone to the PC sound card MIC IN connector.
8. Connect the power cord to the power supply.
9. Plug the power supply cord into a wall outlet.
   The red power LED on the audiometer front panel should glow, indicating that the audiometer is powered.

Copyright 2008 SRMi Consulting, LLC



Connecting a Single CCA-200 Audiometer (shown with simulator)

Key to Numbers in Diagram

1. Headset Cable
2. Simulator Interconnect Cable
3. CCA-200 Audiometer

Copyright 2008 SRMi Consulting, LLC

4. Computer Interface Cable
5. Power Supply
6. Power Cord
7. Response Switch
8. BAS-200 Bio-Acoustic Simulator

Multi-Station Installation of the CCA-200

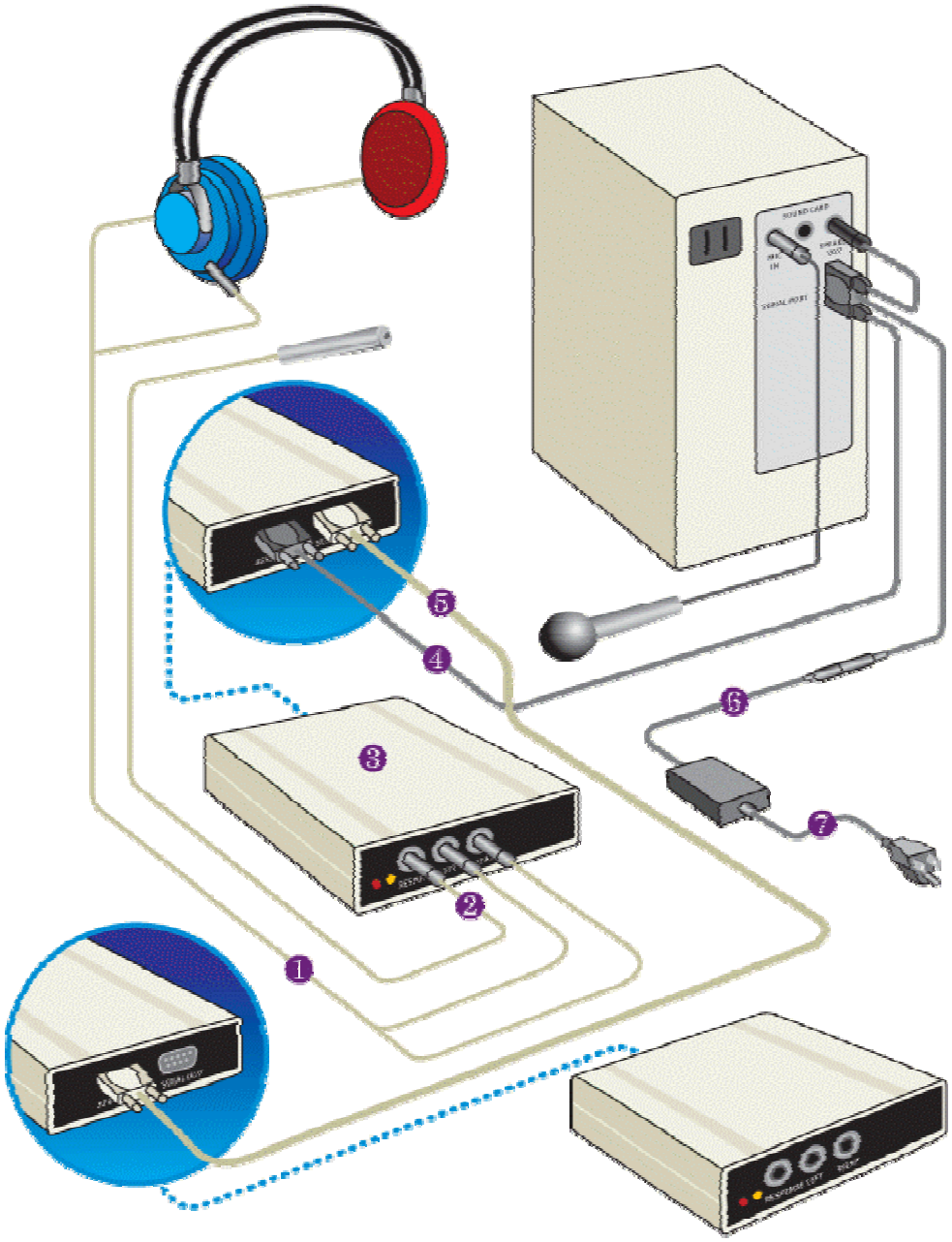
To install additional stations of the CCA-200 audiometer, refer to the diagram and key to diagram numbers below. Follow the instructions in the previous section to install the first station.

Up to sixteen audiometer stations may be controlled from a single computer.

To add additional stations:

1. Unplug the power supply cord from the wall outlet.
2. Connect the serial cable between the Serial Out connector of the first station and the Serial In connector of the next station.
3. Connect the headset and response switch to the second audiometer (connections not shown on diagram).
   If the audiometer is mounted outside the station, use standard patch cords to make connections through the station walls.
4. Plug the power supply cord into the wall outlet.
   The red power LED on the station should glow, indicating that the audiometer is powered.
5. Repeat the steps above for any remaining stations.
   The power supply provided will power up to ten stations. If you are installing more than ten stations in total, contact your Benson Medical Instruments dealer for assistance.

Copyright 2008 SRMi Consulting, LLC



"Daisy-Chaining" CCA-200 Audiometers

Key to Numbers in Diagram

1. Headset Cable
2. Response Switch
3. CCA-200 Audiometer
4. Computer Interface Cable

Copyright 2008 SRMi Consulting, LLC

5. Serial Cable
6. Power Supply
7. Power Cord

Single-Station Installation of the CCA-200mini

To install a single station of the CCA-200mini, refer to the instructions, diagram, and key to diagram numbers below. The diagram shows the CCA-200mini installed with the BAS-200 Bio-Acoustic Simulator.

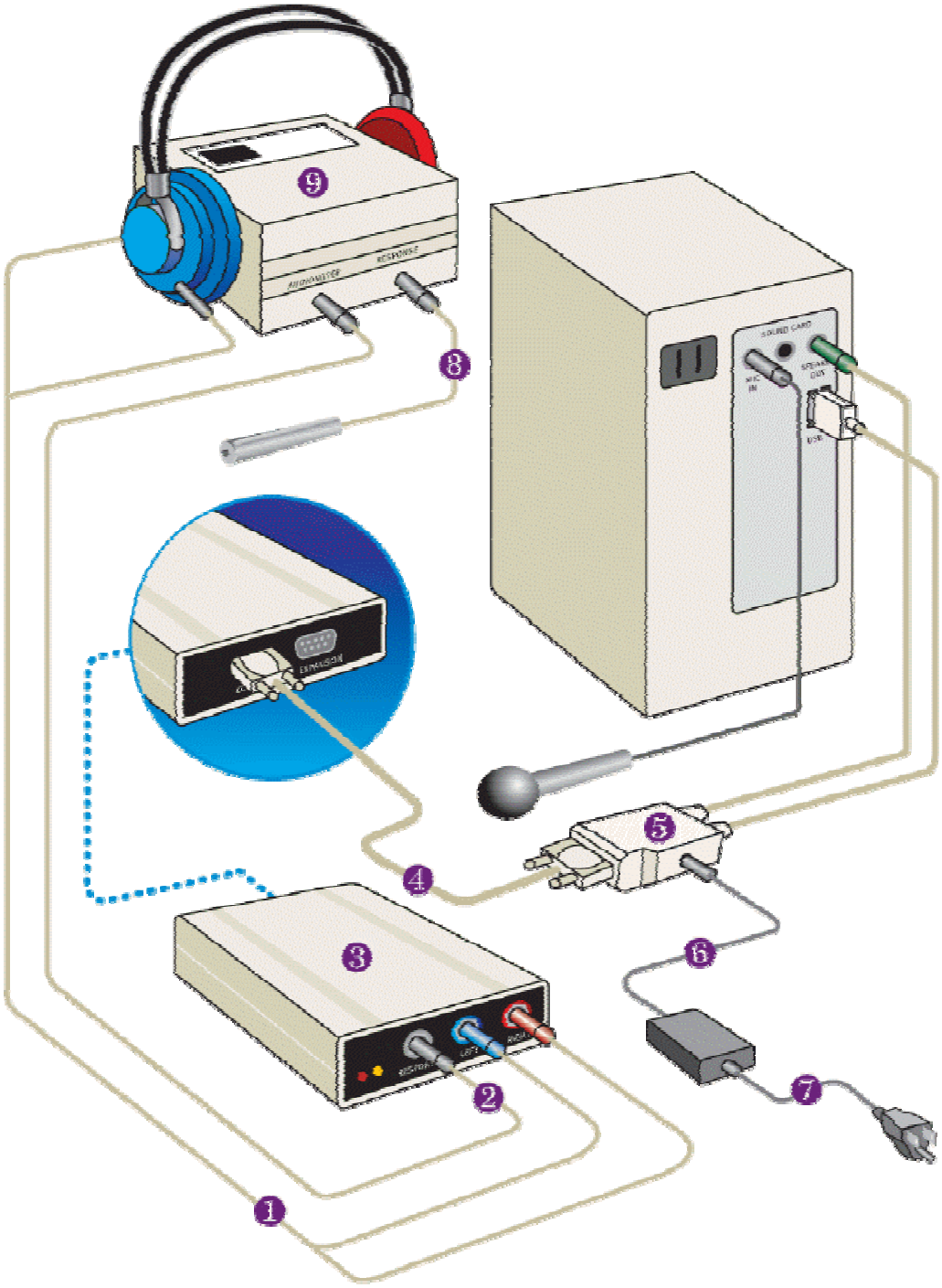
For complete instructions on simulator installation, see Installing the BAS-200 with the CCA-200mini.

To install a single station of the CCA-200mini:

1. If you are making changes to an existing installation, unplug the power supply cord from the wall outlet.
2. Connect one end of the supplied serial cable to the connector marked COMPUTER on the audiometer.
3. Connect the other end of the serial cable to the USB Computer Interface Cable.
4. Connect the USB connector of the USB Computer Interface Cable to the USB connector on the computer.
5. Connect the power supply output connector to the mating jack on the USB Computer Interface Cable.
6. Connect the headset to the audiometer as shown in the diagram below.
7. Connect the response switch as appropriate for either a daily calibration check or testing.
   If a simulator is not installed, connect the response switch to the RESPONSE jack on the audiometer.
   If a simulator is installed:
   For daily calibration checks, the response switch should not be connected to the Bio-Acoustic Simulator.
   For subject testing, the response switch is inserted into the RESPONSE jack of the Bio-Acoustic Simulator.
   If the audiometer is mounted outside the station, use standard patch cords to make connections through the station walls. There should be no need to modify the station.
8. Connect the green connector of the USB Computer Interface Cable to the SPEAKER OUT jack on the PC sound card.
   Carefully check the connector labels on the sound card as many connections use the same type of connector.
   Do not confuse Line In with Line Out. Unless otherwise documented, assume that a jack marked Line refers to Line In.
9. Connect the microphone to the PC sound card MIC IN connector.

Copyright 2008 SRMi Consulting, LLC

10. Connect the power cord to the power supply.
11. Plug the power supply cord into a wall outlet.
    The red power LED on the audiometer front panel should glow, indicating that the audiometer is powered.



Copyright 2008 SRMi Consulting, LLC

Connecting a Single CCA-200mini Audiometer (shown with simulator)

Key to Numbers in Diagram

1. Headset Cable
2. Simulator Interconnect Cable
3. CCA-200mini Audiometer
4. Serial Cable
5. USB Computer Interface Cable
6. Power Supply
7. Power Cord
8. Response Switch
9. BAS-200 Bio-Acoustic Simulator

Multi-Station Installation of the CCA-200mini

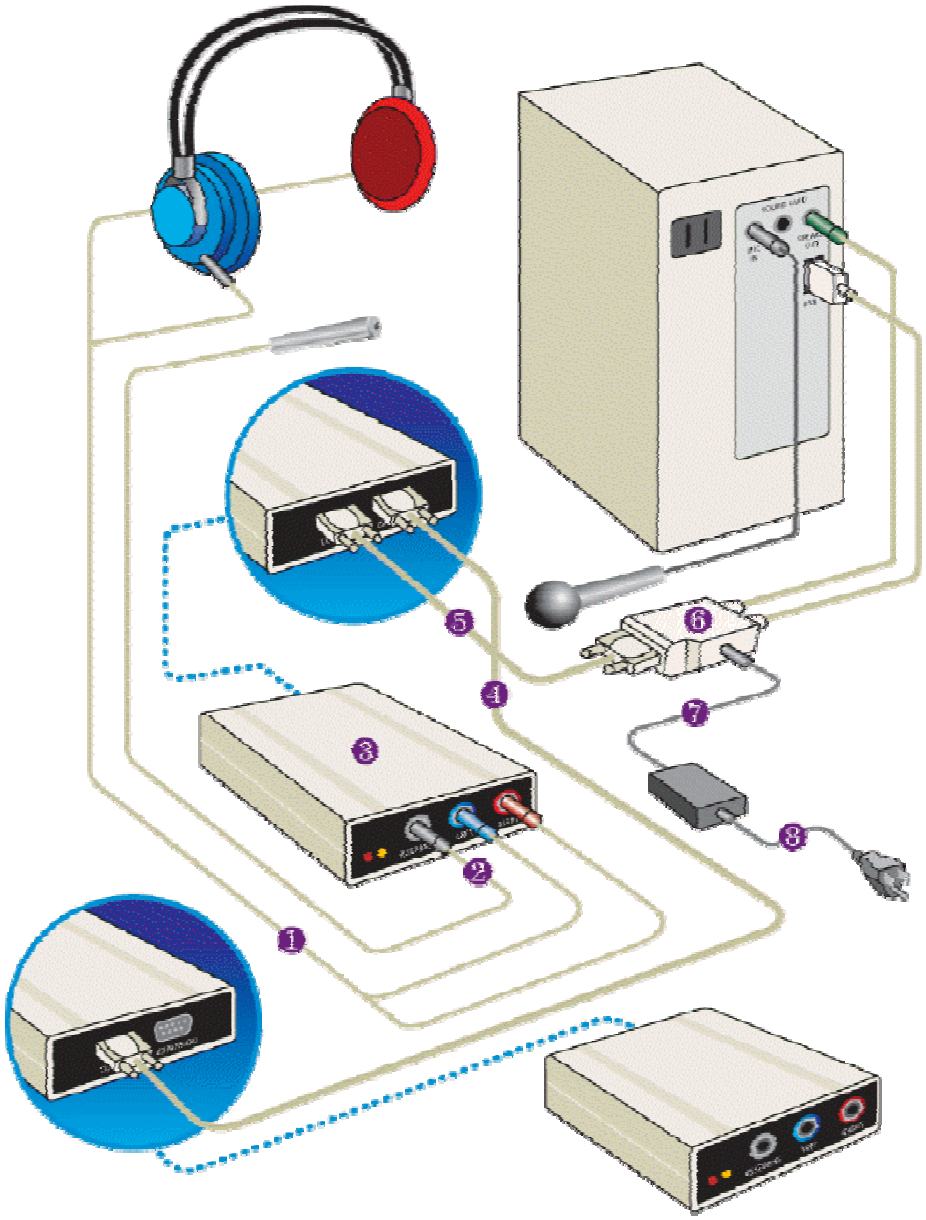
To install multiple stations of the CCA-200mini audiometer, refer to the instructions, diagram, and key to diagram numbers below. The diagram shows an installation of two CCA-200mini audiometers. Follow the instructions in the previous section to install the first station.

Up to sixteen audiometer stations may be controlled from a single computer.

To install multiple stations of the CCA-200mini:

1. Unplug the audiometer power supply cord from the wall outlet.
2. Connect the supplied serial cable between the COMPUTER port of the second audiometer and the EXPANSION port of the first audiometer.
3. Connect the headset and response switch to the second audiometer (connections not shown on diagram).
   If the audiometer is mounted outside the station, use standard patch cords to make connections through the station walls.
4. Plug the power supply cord into the wall outlet.
   The red power LED on the front panel of the audiometer should glow, indicating that the audiometer is powered.
5. Repeat the steps above for any remaining audiometers.

Copyright 2008 SRMi Consulting, LLC



"Daisy-Chaining" CCA-200mini Audiometers

Key to Numbers in Diagram

1. Headset Cable
2. Response Switch
3. CCA-200mini Audiometer
4. Serial Cable
5. Serial Cable
6. USB Computer Interface Cable

Copyright 2008 SRMi Consulting, LLC

7. Power Supply
8. Power Cord

Wall Mounting

The audiometer may be mounted to a wall or surface inside the test booth using the optional booth mounting plate.

To use the booth mounting plate:

1. Attach the booth mounting plate to the sound booth with screws through the four screw holes.
2. Slide the audiometer onto the mounting plate.
   The bottom bracket of the audiometer slides onto the plate. When the audiometer is slid on fully, the locking tab will click.

Initial Administrator Log-In and Setup

The first time the audiometer software is run, the only user and password set up are those of the Administrator (i.e., system administrator). The default password for the Administrator is null (i.e., nothing should be entered). After the initial log-in by the Administrator, users and passwords can be set up so that operation of the audiometer will be password-protected.

For information on setting up other users, see User Names and User Passwords.

IF YOU DO NOT HAVE THE PLUS PACKAGE:

The first time you run the audiometer software:

The Welcome dialog box appears. The user name is already entered as 'Administrator'.

1. Leaving the Password edit box blank, choose OK or press the <Enter> key.
   The audiometer display appears.
2. Choose Passwords from the File menu.
   The Passwords dialog box appears. The Administrator is already selected.
3. Click the Modify push button.
   The Modify Password dialog box appears.
4. Enter your password in the New Password and Confirm New Password edit boxes.
5. Choose OK.
   Do not forget this password or you will not be able to access the audiometer software.
6. In the Passwords dialog box, choose Close.

Copyright 2008 SRMi Consulting, LLC

IF YOU HAVE THE PLUS PACKAGE:

Check with your network administrator about whether you will use a different server and database. Unless you receive instructions to the contrary from your network administrator, you may leave the default server and default database in place. If you plan to change the server and database names from the default ones, see Database Password and Windows Security, below.

Check with your network administrator about whether there are going to be multiple users on a network; if so, see Multi-User Installation.

The first time you run the audiometer software:

The Welcome dialog box appears.

The user name is already entered as 'Administrator.' Most users will not make changes to the Server and Database edit boxes.

1. Leaving the Password edit box blank, choose OK or press the <Enter> key.
   The audiometer display appears.
2. Choose Passwords from the File menu.
   The Passwords dialog box appears. The Administrator is already selected.
3. Click the Modify push button.
   The Modify Password dialog box appears.
4. Enter your password in the New Password and Confirm New Password edit boxes.
5. Choose OK.
   Do not forget this password or you will not be able to access the audiometer software.
6. In the Passwords dialog box, choose Close.

Database Password and Windows Security

If you have received instructions from your network administrator that you need to enter a server and a database in the Welcome dialog box that are different from the default ones, the security measures of the audiometer software will require you to enter a database user name and database password. However, you will be using Windows Security, you will not need to provide a database user name or database password.

To enter a database user name and database password or select Windows Security:

1. In the Welcome dialog box, enter your server in the Server edit box.
2. Enter your database in the Database edit box.
   An error message will appear.
3. Choose OK in the error message.
   The Database Login dialog box appears.

Copyright 2008 SRMi Consulting, LLC

- Enter your database user name and database password in the appropriate edit boxes.

  OR

- Select the Use Windows Security check box.

4. Choose OK.
5. In the Welcome dialog box, choose OK.

Audiometer Setup

If you are running the audiometer for the first time, also see the next section, Setting Up the Audiometer.

The Setup dialog box contains three pages, described below. (To see the Setup dialog box, choose Setup from the Audiometer menu in the Control Window.)

GENERAL PAGE

On the General page, the Port combo box shows computer serial ports. This combo box will contain a choice BMII1, which is the virtual port created by Windows Plug and Play. Choose another port only in the rare event that Plug and Play does not operate.

The PnP Booth/Serial No. Assignment check box refers to the automatic assignment, if Plug and Play is operating, of serial numbers to audiometers. If this check box is not selected, automatic assignment will be disabled. You may need to configure the audiometer(s) manually in the future if you add, swap, or remove audiometers, or connect one to a different serial port. See Manual Configuration (non-Plug and Play).

The Instrument Graphs are the Audiogram Graph and, if you have a Sound Level Meter, the Sound Level Graph. If the Display Instrument Graphs check box is checked, the graphs will be displayed in the information tabs. For information on the information tabs, see Audiometer Information Tabs and Sound Level Meter Information Tab.

If the Use Sound Card for Alarms check box is checked, the Test Complete Alarm and the Error Alarm will be played through the PC sound card rather than the PC speaker. Some PC computers, especially laptops, may not have PC speakers and will require this feature. In this case you must use a wye (‘Y’) adapter to connect both a set of powered speakers and the computer interface cable to the output of the PC audio. Both the alarms and the start and error instructions will be played over the powered speakers but the test subject will hear only the start and error instructions.

If the Enable Annual Calibration Warning check box is checked, a warning will be displayed if the annual calibration of any audiometer is due in a given number of days. The number of days is shown in the Days Before Annual Calibration Warning edit box. Clearing this check box disables the warning. For information on setting the warning message, see Annual Calibration Warning.

Copyright 2008 SRMi Consulting, LLC

If the Enable Sound Level Meter Annual Calibration Warning check box is checked, a warning will be displayed if the annual calibration of any Sound Level Meter is due in a given number of days. The number of days is shown in the Days Before Sound Level Meter Annual Calibration Warning edit box. For information on setting the warning message, see Sound Level Meter Calibration Warning.

The Test Complete Alarm combo box allows you to choose the desired volume of the alarm that sounds when the test is complete. Valid selections are Short, Medium, Long, Continuous, and Off to disable the alarm.

The Error Alarm combo box allows you to choose the desired volume of the alarm that sounds when an error occurs during testing. Valid selections are Short, Medium, Long, Continuous, and Off to disable the alarm. Errors are discussed in the topic Error Handling.

Your choice in the Database Interface combo box will vary depending on the commercial database that you are using with the audiometer. If unsure, refer to Database Interfaces.

The Name/ID/Subject ID Format combo box allows you to set the Name/ID/Subject ID field in the Control Window to display the subject's name (Last Name, First Name), ID, or Subject ID.

SERIAL NUMBERS

The Serial Number page shows the serial numbers of the audiometers and, if you have one or more Sound Level Meters, the serial numbers of the sound level meter(s). Serial numbers are assigned to audiometers and sound level meters in the order of connection. To change the order, see Changing Configurations.

If you enter serial numbers manually, serial numbers do not need to be entered in the order that the instruments are physically connected. Ignore unused fields.

SOUND LEVEL METER MAPPING

For information on the Sound Level Meter Mapping page, see Configuring the Sound Level Meter.

Database Interfaces

The audiometer can transfer data to third-party hearing conservation databases. A unique feature of the audiometer is its ability to work real-time with information from a database. This feature allows the audiometer software to choose starting levels, and perform analysis and retests based on previous and baseline tests.

The Database Interfaces combo box in the Setup dialog box shows available databases. At publication time, interfaces for HearTrak (Windows), HearTrak (DOS) (Hawkwa Group), OHM (Unique Software Solutions), Medgate, FOSHM, Systoc, and DOHRS-HC (U.S. Department of Defense) were included. Contact your dealer for the latest information concerning interfaces to other third-party software.

Copyright 2008 SRMi Consulting, LLC

For information on communication between your audiometer and a database, see the sections beginning with Data Transfer.

If you have the Plus Package and are not planning to use a third-party database, choose 'Storage' as your Database Interface.The Plus Package is an optional integrated extension of the audiometer software; see Storage/Plus Package Features for more information.

Storage is included with the audiometer software. For an overview of sections on Storage, see the "STORAGE / PLUS PACKAGE" section in the Table of Contents (the first section there is Storage/Plus Package). For typical testing and saving procedures with Storage, see the sections beginning with Performing an Audiogram.

To see the Setup dialog box:

1. From the Audiometer menu, choose Setup.

Setting Up the Audiometer

The first time you run the audiometer software, the serial numbers and serial port connection of the audiometer(s) and sound level meter(s) (if applicable) are automatically detected.

To see the serial numbers and serial port connection:

1. The Setup dialog box should appear automatically. If not, choose Setup under the Audiometer menu.
2. Choose the Serial Numbers tab.
   Serial numbers are assigned to audiometers and sound level meters in the order of connection. To change the order, see Changing Configurations.
3. Choose the General tab.
4. Choose settings as desired.
   The Port combo box will contain the choice 'BMI1', which is the virtual port created by Windows Plug and Play. Choose another port only in the rare event that Plug and Play does not operate.
5. If you are using a Sound Level Meter, select the Sound Level Meter Mapping tab to check the configuration. See Configuring the Sound Level Meter.
6. When finished with the Setup dialog box, choose OK.

Copyright 2008 SRMi Consulting, LLC

Volume for Instructions and Microphone

To set the volume for the voice instructions and talk-over microphone:

1. Open the sound card volume control application.
   The default location for this application is:
   Start Menu\Programs\Accessories\Entertainment\Volume Control.
2. Adjust the volume with the slide controls.
   The Wave slide control adjusts the level of the voice instructions. The Volume Control adjusts the overall volume for the sound card and therefore also adjusts the level of the talk-over microphone.

Changing Configurations

If you add, swap or remove audiometer stations or sound level meters, or change the serial port that the audiometer or sound level meter is connected to, follow the instructions in this section.

If you are running a Plug and Play operating system such as Windows 2000, follow the instructions in Plug and Play Configuration, below. Otherwise, follow the Manual Configuration instructions.

Plug and Play Configuration

You may, at some future time, add or remove stations or connect your audiometer or sound level meter to a different serial port.

To change the audiometer or sound level meter configuration:

1. Restart your computer with the new configuration connected.
   Plug and Play will detect a change of serial port connection.
2. Start the application.
   The application will detect any changes. If changes are detected, a dialog box may appear asking you to confirm the changes.

- Plug and Play detects the audiometer stations and sound level meters in the order of connection. If the station order varies from the connection order, follow the instructions in Manual Configuration, below.

Manual Configuration (non-Plug and Play)

Non-Plug and Play operating systems can't detect the addition or removal of devices or changes in serial port connection. If you change the stations associated with the audiometer station, you need to change the configuration. In addition, advanced users may find it more convenient to manually configure the installation.

Copyright 2008 SRMi Consulting, LLC

To manually alter your configuration:

1. From the Control Window, choose Setup from the Audiometer menu.
   The Setup dialog box appears.
2. Make all necessary changes.
   For detailed instructions for the Setup dialog box, see Audiometer Setup.
3. When finished, choose OK.

Copyright 2008 SRMi Consulting, LLC

Plus Package Installation

Installing the Plus Package

The Plus Package is a group of software features that are enabled by attaching a hardware key to your computer. To install the Plus Package on your computer, connect the Plus Package hardware key. After the hardware key is installed, simply start the audiometer software and Plus Package features will be enabled.

To install the Plus Package hardware key on your computer:

1. Locate the parallel port on the back of your computer.
   This port is usually used by the parallel printer.
2. Attach the hardware key to the parallel port and hand-tighten the thumb screws.
   The end of the key to be attached to the port is labeled COMPUTER.

   If you are using a parallel printer, the key is first installed on the port and the printer cable is plugged into the key. The key is designed to have no effect on the operation of your printer or on the operation of other keys installed on your port.

To start the Plus Package:

1. Start the audiometer software under Programs in the Windows Start menu, or double-click the icon on the desktop.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Bio-Acoustic Simulator Installation

Installing the Bio-Acoustic Simulator

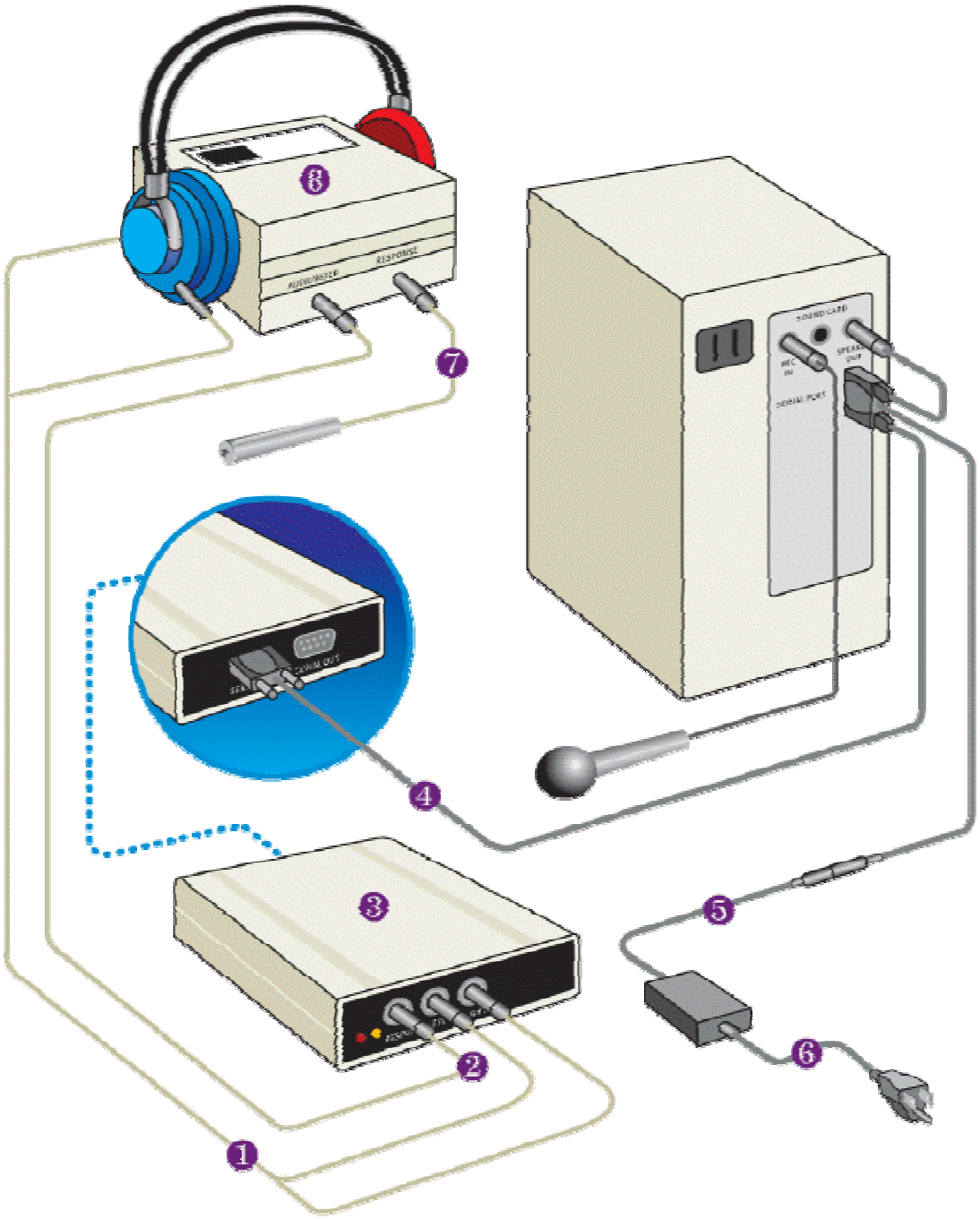
The installation of the Bio-Acoustic Simulator with either the CCA-200 audiometer or the CCA-200mini audiometer is described in the following sections.

Installing the BAS-200 with the CCA-200

The Bio-Acoustic Simulator provides a convenient method for doing the required daily biologic check of the audiometer. The simulator can be left installed at all times for additional convenience and time savings and may either sit on a table or shelf or be mounted on the wall with the included wall mounting bracket. The simulator operates with power supplied from the audiometer so there is no need to check that the unit is switched off when not in use or change batteries.

The simulator is installed with the CCA-200 audiometer as shown in the diagram below. See also the key to diagram numbers below. The supplied interconnect cable is plugged into the RESPONSE jack of the audiometer and the AUDIOMETER jack of the simulator. For daily calibrations the response switch is disconnected from the simulator. For subject testing, the response switch is inserted into the RESPONSE jack of the simulator. Internal switching removes the simulator from the circuit so that it may be left installed at all times with no effect on testing.

Copyright 2008 SRMi Consulting, LLC



Connecting the Bio-Acoustic Simulator with the CCA-200 Audiometer

Key to Diagram Numbers

1. Headset Cable
2. Simulator Interconnect Cable
3. CCA-200 Audiometer

Copyright 2008 SRMi Consulting, LLC

4. Computer Interface Cable
5. Power Supply
6. Power Cord
7. Response Switch
8. BAS-200 Bio-Acoustic Simulator

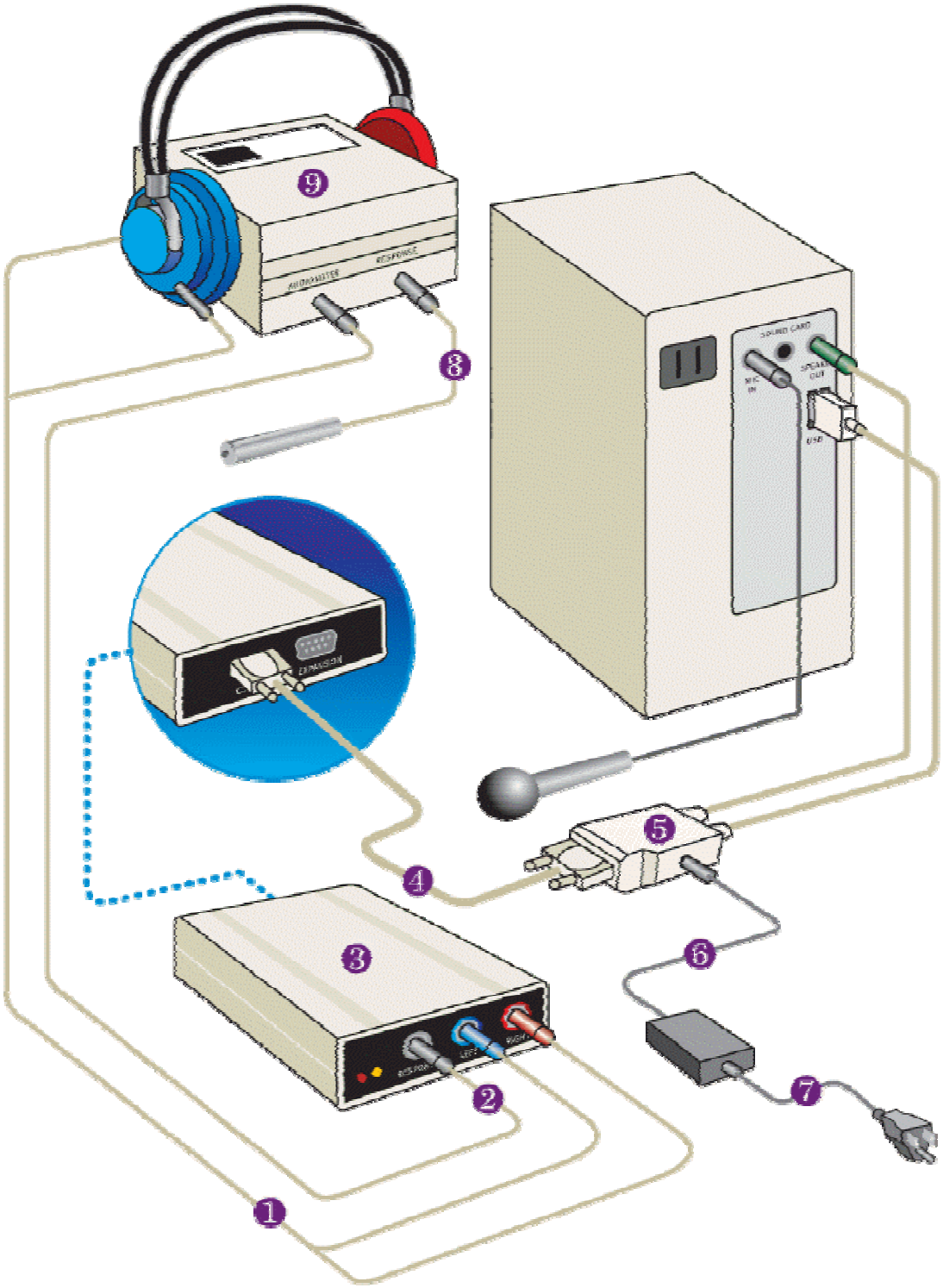
Installing the BAS-200 with the CCA-200mini

The Bio-Acoustic Simulator provides a convenient method for doing the required daily biologic check of the audiometer. The simulator can be left installed at all times for additional convenience and time savings and may either sit on a table or shelf or be mounted on the wall with the included wall mounting bracket. The simulator operates with power supplied from the audiometer so there is no need to check that the unit is switched off when not in use or change batteries.

To install the BAS-200 with the CCA-200mini, refer to the instructions, diagram, and key to diagram numbers below. The installation shown does not use the wall mounting bracket. For instructions on installation using the bracket, see Bracket for BAS-200 or BAS-200slm with CCA-200mini, below.

The supplied interconnect cable is plugged into the RESPONSE jack of the audiometer and the AUDIOMETER jack of the simulator. For daily calibrations the response switch is disconnected from the simulator. For subject testing, the response switch is inserted into the RESPONSE jack of the simulator. Internal switching removes the simulator from the circuit so that it may be left installed at all times with no effect on testing.

Copyright 2008 SRMi Consulting, LLC



Connecting the Bio-Acoustic Simulator with the CCA-200mini Audiometer

Copyright 2008 SRMi Consulting, LLC

Key to Diagram Numbers

1. Headset Cable
2. Simulator Interconnect Cable
3. CCA-200mini Audiometer
4. Serial Cable
5. USB Computer Interface Cable
6. [Power Supply
7. Power Cord
8. Response Switch
9. BAS-200 Bio-Acoustic Simulator

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

BAS-200slm and SLM-200 Installation

Installing the BAS-200slm or SLM-200

The following sections describe how to install the BAS-200 Bio-Acoustic Simulator/Sound Level Meter with the CCA-200 audiometer or the CCA-200mini audiometer, and how to install the SLM-200 Sound Level Meter with the CCA-200 audiometer.

Installing the BAS-200slm with the CCA-200

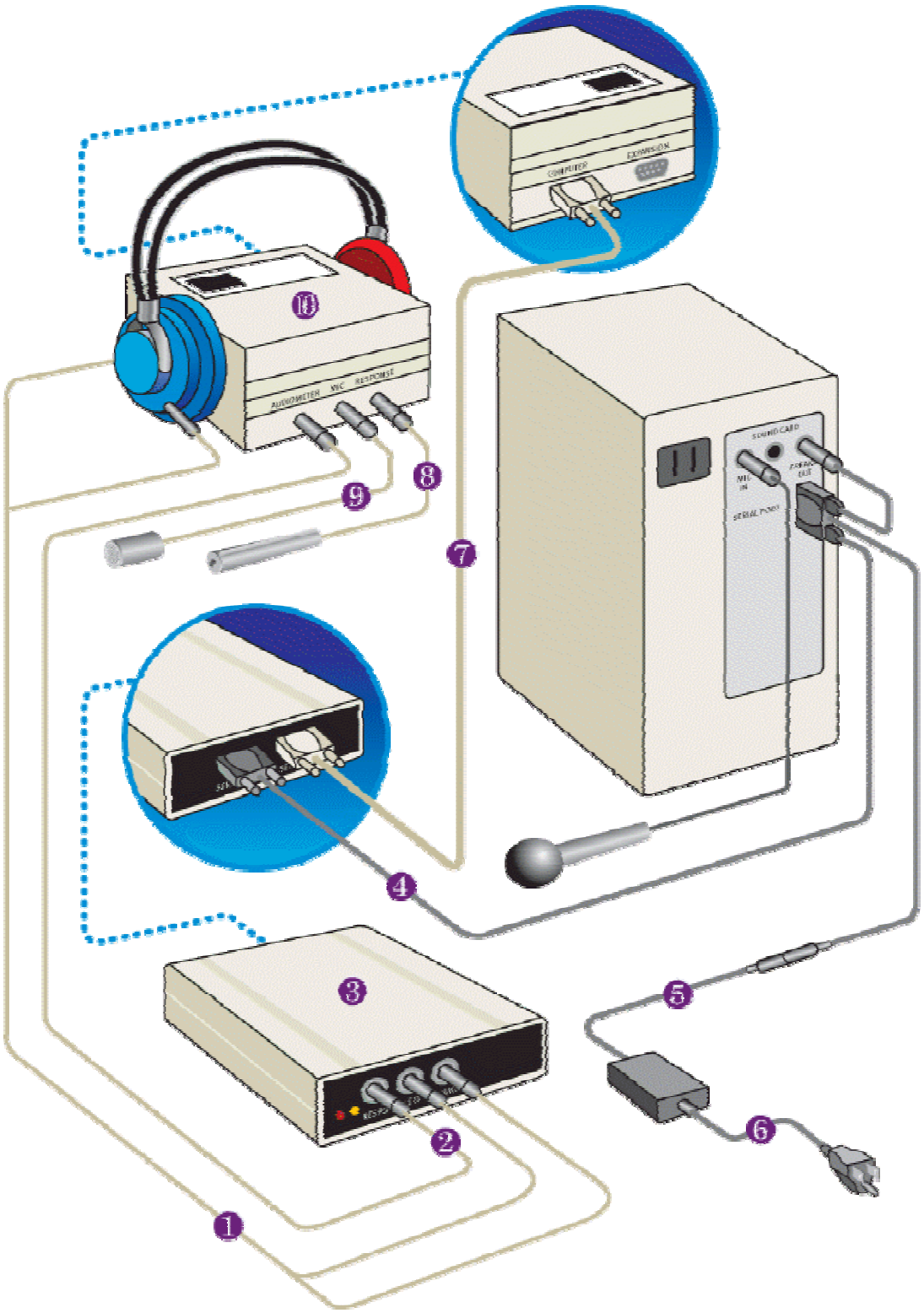
To install the BAS-200slm Bio-Acoustic Simulator/Sound Level Meter with the CCA-200, refer to the diagram and key to diagram numbers below.

Up to sixteen instruments total may be controlled from a single computer.

To install the BAS-200slm with the CCA-200 audiometer:

1. Unplug the audiometer power supply cord from the wall outlet.
2. Connect the supplied serial cable between the COMPUTER port of the Simulator/Sound Level Meter and the EXPANSION port of the audiometer.
3. Connect the supplied interconnect cable between the RESPONSE jack of the audiometer and the AUDIOMETER jack of the simulator/sound level meter.
   For daily calibration checks, the response switch should not be connected to the Simulator/Sound Level Meter. For subject testing, the response switch is inserted into the RESPONSE jack of the Simulator/Sound Level Meter. Internal switching removes the Simulator/Sound Level Meter from the circuit so that it may be left installed at all times with no effect on testing.
4. Plug the microphone into the MIC jack on the Simulator/Sound Level Meter.
5. Suspend the microphone from the ceiling for best results.
6. Plug the power supply cord into the wall outlet.
   The red power LED on the Simulator/Sound Level Meter should glow, indicating that the instrument is powered.
7. Repeat the preceding steps for any remaining audiometers or Simulator/Sound Level Meters.
   The power supply provided will power up to ten instruments. If you are installing more than ten instruments in total, contact your Benson Medical Instruments dealer for assistance.

Copyright 2008 SRMi Consulting, LLC



Installing the Bio-Acoustic Simulator/Sound Level Meter with the CCA-200

Copyright 2008 SRMi Consulting, LLC

Key to Numbers in Diagram

1. Headset Cable
2. Simulator Interconnect Cable
3. CCA-200 Audiometer
4. Computer Interface Cable
5. Power Supply
6. Power Cord
7. Serial Cable
8. Response Switch
9. Microphone
10. BAS-200slm Bio-Acoustic Simulator/Sound Level Meter

Installing the BAS-200slm with the CCA-200mini

To install the BAS-200slm Bio-Acoustic Simulator/Sound Level Meter with the CCA-200mini, refer to the diagram and key to diagram numbers below. The installation shown does not use the wall mounting bracket. For instructions on installation using the bracket, see Bracket for BAS-200 or BAS-200slm with CCA-200mini, below.

Up to sixteen instruments total may be controlled from a single computer.

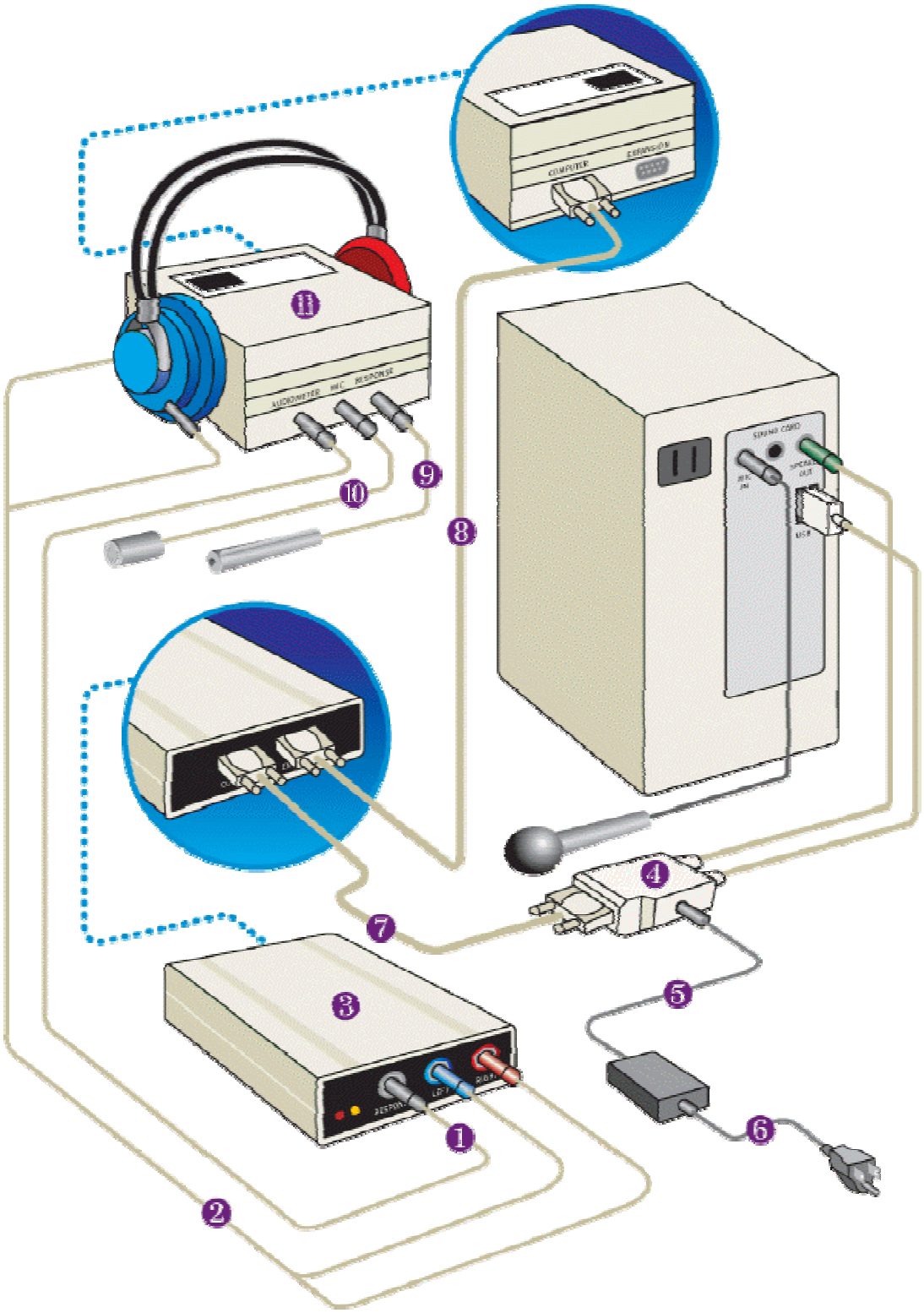
To install the BAS-200slm with the CCA-200mini audiometer:

1. Unplug the audiometer power supply cord from the wall outlet.
2. Connect the supplied serial cable between the COMPUTER port of the Simulator/Sound Level Meter and the EXPANSION port of the audiometer.
3. Connect the supplied interconnect cable between the RESPONSE jack of the audiometer and the AUDIOMETER jack of the simulator/sound level meter. For daily calibration checks, the response switch should not be connected to the Simulator/Sound Level Meter. For subject testing, the response switch is inserted into the RESPONSE jack of the Simulator/Sound Level Meter. Internal switching removes the Simulator/Sound Level Meter from the circuit so that it may be left installed at all times with no effect on testing.
4. Plug the microphone into the MIC jack on the Simulator/Sound Level Meter.
5. Suspend the microphone from the ceiling for best results.
6. Plug the power supply cord into the wall outlet.
   The red power LED on the Simulator/Sound Level Meter should glow, indicating that the instrument is powered.

Copyright 2008 SRMi Consulting, LLC

7. Repeat the preceding steps for any remaining audiometers or Simulator/Sound Level Meters.
   The power supply provided will power up to ten instruments. If you are installing more than ten instruments in total, contact your special instruments dealer for assistance.

Copyright 2008 SRMi Consulting, LLC



Installing the Bio-Acoustic Simulator/Sound Level Meter with the CCA-200mini

Copyright 2008 SRMi Consulting, LLC

Key to Numbers in Diagram

1. Simulator Interconnect Cable
2. Headset Cable
3. CCA-200mini Audiometer
4. USB Computer Interface Cable
5. Power Supply
6. Power Cord
7. Serial Cable
8. Serial Cable
9. Response Switch
10. Microphone
11. BAS-200slm Bio-Acoustic Simulator/Sound Level Meter

Installing the SLM-200 with the CCA-200

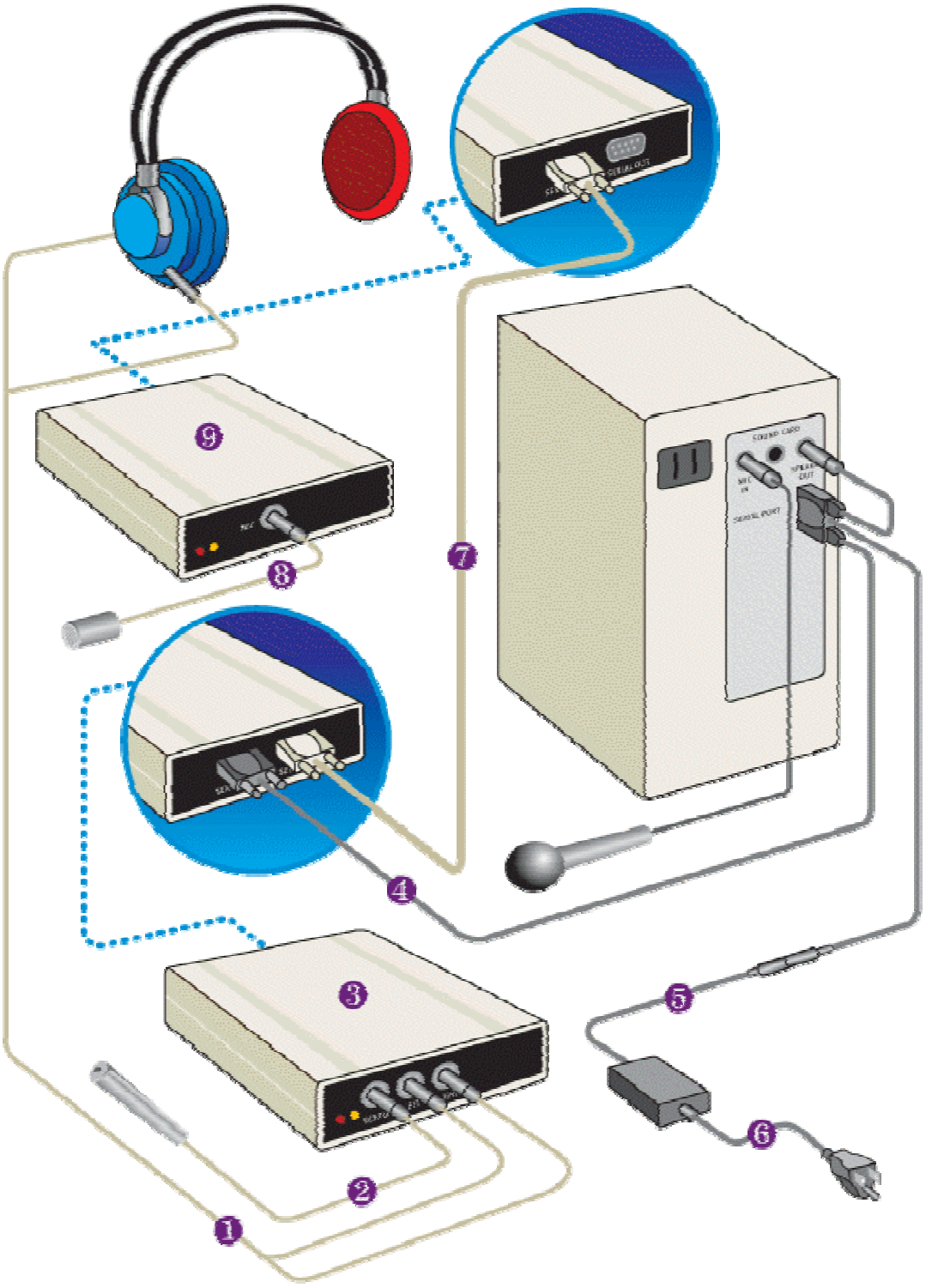
To install the SLM-200, refer to the diagram and key to diagram numbers below.

Up to sixteen instruments total may be controlled from a single computer.

To install the Sound Level Meter, refer to the figure below.

1. Unplug the power supply cord from the wall outlet.
2. Connect the serial cable between the Serial Out connector of the audiometer and the Serial In connector of the Sound Level Meter.
3. Plug the microphone into the MIC jack on the Sound Level Meter.
4. Suspend the microphone from the ceiling for best results.
5. Plug the power supply cord into the wall outlet.
   The red power LED on the Sound Level Meter should glow, indicating that the instrument is powered.
6. Repeat the preceding steps for any remaining audiometers or Sound Level Meters.
   The power supply provided will power up to ten instruments. If you are installing more than ten instruments in total, contact your special instruments dealer for assistance.

Copyright 2008 SRMi Consulting, LLC



Installing the SLM-200 Sound Level Meter with the CCA-200 Audiometer

Copyright 2008 SRMi Consulting, LLC

Key to Numbers in Diagram

1. Headset Cable
2. Response Switch
3. CCA-200 Audiometer
4. Computer Interface Cable
5. Power Supply
6. Power Cord
7. Serial Cable
8. Microphone
9. SLM-200 Sound Level Meter

Configuring the Sound Level Meter

If you have a sound level meter that is already installed, the sound level meter may be configured automatically by the software, which tries to make intelligent determinations for common configurations. However, the user should verify that the mapping is what the user wants.

Use the Sound Level Meter Mapping tab in the Setup dialog box to indicate which audiometer(s) are connected to which sound level meter(s). The numbers of the sound level meter and audiometers are determined by the Serial Numbers tab. Suppose your sound level meter is listed as '1' in the Serial Numbers tab, and you wish this sound level meter to measure noise for your two audiometers. You would then choose '1' in the first three combo boxes in the Sound Level Meter Mapping tab.

Only one sound level meter may be mapped to an audiometer.

To configure the Sound Level Meter:

1. Under the Audiometer menu in the Control Window, choose Setup.
   The Setup dialog box appears.
2. Choose the Sound Level Meter Mapping tab.
3. Using the combo boxes, indicate which sound level meter should measure the sound levels for which audiometer.
4. When finished, choose OK.

Copyright 2008 SRMi Consulting, LLC

Bracket

Bracket for BAS-200 or BAS-200slm with CCA-200mini

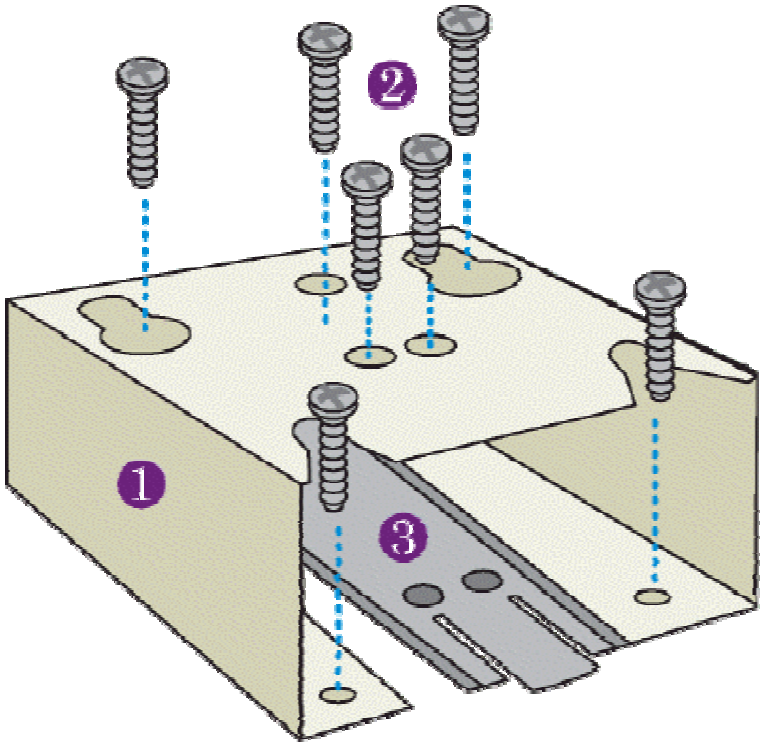
The installation of the bracket for the BAS-200 or BAS-200slm with the CCA-200mini is described in the following sections.

Installation of Bracket on Wall

The instructions, diagram, and key to diagram numbers below describe how to install the bracket on the wall.

To install the wall mounting bracket on the wall:

1. Position the bracket with the mounting plate inside it at the desired position on the wall.
2. Using the supplied screws, screw the bracket and mounting place into place.



Installation of Bracket

Key to Numbers in Diagram

1. Bracket
2. Mounting Plate

Copyright 2008 SRMi Consulting, LLC

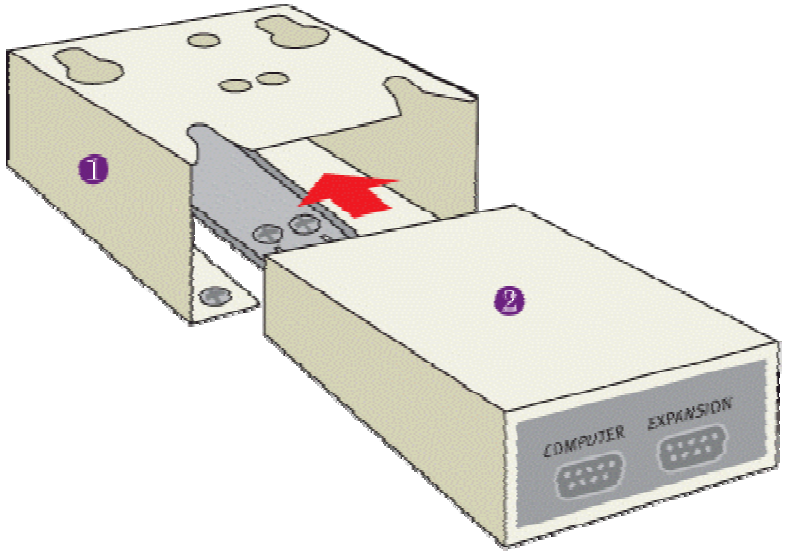
3. 7 Screws

Installation of Audiometer in Bracket

The instructions, diagram, and key to diagram numbers below describe how to install the CCA-200mini audiometer into the bracket.

To install the audiometer into the bracket:

1. Position the audiometer above the bracket as shown.
2. Slide the audiometer into place in the mounting plate until the tab locks in place.



Installation of Audiometer in Bracket

Key to Numbers in Diagram

1. Bracket
2. CCA-200mini Audiometer

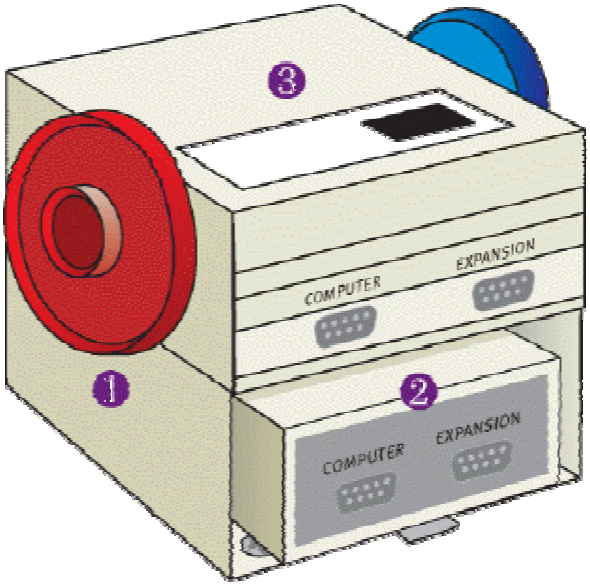
Installation of BAS-200 or BAS-200slm in Bracket

The instructions, diagram, and key to diagram numbers below describe how to install the BAS-200 or BAS-200slm into the bracket.

To install the BAS-200 or BAS-200slm into the bracket:

1. Insert the feet of the BAS-200 or BAS-200slm into the four large openings on the front of the bracket.
2. Slide the instrument downward until it is firmly in place.

Copyright 2008 SRMi Consulting, LLC



Installation of Simulator or Simulator/Sound Level Meter in Bracket

Key to Numbers in Diagram

1. Bracket
2. CCA-200mini Audiometer
3. Simulator or Simulator/Sound Level Meter

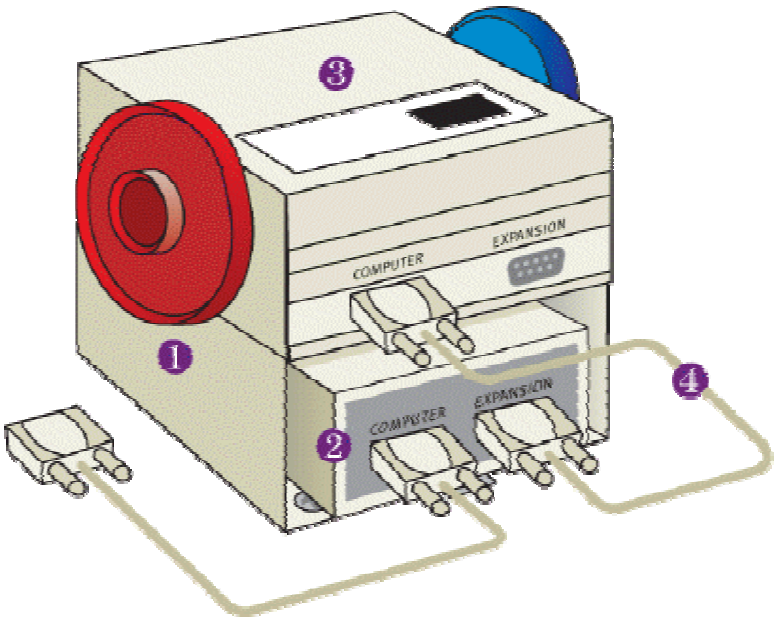
Cabling of Equipment in Bracket

The instructions, diagram, and key to diagram numbers below describe how to cable the BAS-200slm with the CCA-200mini audiometer in the bracket.

To cable the equipment in the bracket:

1. Connect one end of the serial cable to the COMPUTER port on the BAS-200slm.
2. Connect the other end of the serial cable to the EXPANSION port on the audiometer.

Copyright 2008 SRMi Consulting, LLC



Cabling of Equipment in Bracket

Key to Numbers in Diagram

1. Bracket
2. CCA-200mini Audiometer
3. Simulator/Sound Level Meter

s4. Serial Cable

Copyright 2008 SRMi Consulting, LLC

User Passwords and Multi-User Installation

User Names and User Passwords

Access to the audiometer is restricted by password. The audiometer software allows you to set up individual users and associated passwords to control access to the program. Only users with administrator access can add and delete users. See the next section for information on what the different types of users are allowed to do.

A user name and user password must always be entered when the audiometer software is started.

The Passwords dialog box lists all the users and shows the level of access for each user. This dialog box is available only to users with administrator access.

PLUS PACKAGE ONLY

If you have the Plus Package, you have the option of also using database security measures; see Initial Administrator Log-In and Setup.

To see the Passwords dialog box:

1. Choose Passwords from the File menu.

User Access Levels

There are two levels of user access. Each user is assigned an access level when that person's username, user password, and other security information are entered by the administrator.

The access levels are:

Operator:	access to all areas of the audiometer except password setup, user-defined field "Advanced" settings, and the Add and Modify functions of the Test Configuration List dialog box. (Plus Package Only:) The operator cannot modify the Notification Letter or use Report Options. The operator also

Copyright 2008 SRMi Consulting, LLC

	cannot add, modify, delete, or duplicate Extract Configurations, Merge Configurations, Formats, and Filters.
Administrator:	access to all areas of the audiometer; sets Operator passwords and, if desired, database security information.

Adding Users

Only users with administrator access can add users.

IF YOU DO NOT HAVE THE PLUS PACKAGE:

To add users:

1. Choose Passwords from the Control Window File menu.
   The Passwords dialog box appears.
2. Choose the Add push button.
   The Add User dialog box appears.
3. Enter the user name in the User name edit box.
4. Select the access level for this user in the Access combo box.
5. Enter the password in the Password and Confirm Password edit boxes.
6. When finished, choose OK.
7. In the Passwords dialog box, choose Close.

IF YOU HAVE THE PLUS PACKAGE:

To add users:

1. Choose Passwords from the Control Window File menu.
   The Passwords dialog box appears.
2. Choose the Add push button.
   The Add User dialog box appears.
3. Enter the user name in the User name edit box.
4. Select the access level for this user in the Access combo box.
5. Enter the password in the Password and Confirm Password edit boxes.

Copyright 2008 SRMi Consulting, LLC

6. Choose whether you are going to enter the database username and database password, or use Windows Database Security.
   If you choose to use Windows Database Security, you will not be able to enter a database username and database password.
7. When finished, choose OK.
8. In the Passwords dialog box, choose Close.

Modifying Users

Only users with administrator access can edit users.

To edit users:

1. Choose Passwords from the Control Window File menu.
   The Passwords dialog box appears.
2. Select the user to modify and choose the Modify push button.
   If you chose the Administrator, the Modify Password dialog box will appear. If you chose another user, the Modify User dialog box will appear.
3. Make changes as desired.
4. When finished, choose OK.
5. In the Passwords dialog box, choose Close.

Deleting Users

Only users with administrator access can delete users.

To delete users:

1. Choose Passwords from the Control Window File menu.
   The Passwords dialog box appears.
2. Select the user to delete.
3. Choose the Delete push button.
4. Confirm the deletion by choosing OK.
   The Administrator may not be deleted.
5. In the Passwords dialog box, choose Close.

Multi-User Installation

PLUS PACKAGE ONLY

This section is intended for those who plan to run a Benson Medical Instruments database on a computer that is on the same network as at least one other Benson Medical product. Each Benson Medical Instruments product runs an MSDE server. Contact Benson Medical Instruments Co. for assistance if you need to find out the

Copyright 2008 SRMi Consulting, LLC

MSDE instance names of the MSDE servers on your Benson Medical products, or if your network administrator wishes to set up a SQL server for the network.

You may need to find out the IP address, NetBIOS name, or work group of the computer that is running the Benson Medical database before following the procedure below. If the IP address is dynamic, contact your network administrator for assistance.

1. Install the program on Computer 1.
2. Install the program on Computer 2.
3. Install the program on any additional computers that will be on the network.
4. The user on Computer 2 launches the program and, in the Welcome dialog box, browses to the MSDE server on Computer 1.
5. Repeat as necessary for any additional users.

Viewing the Work of Other Users

PLUS PACKAGE ONLY

If you have multiple users using the same database, you may need to see the latest data entered by others. The screen is automatically updated to include the work of other users when you add, modify, or delete a subject, audiogram, or company. You may wish, however, to see the current state of the database even if you have not recently made any changes to it. If you wish to refresh the screen manually, follow the instructions below.

To see the changes made by other users:

1. From the View menu in the Control Window, choose Refresh.
   The screen is updated to include the work of other users.

Copyright 2008 SRMi Consulting, LLC

Error Log

Error Log

The Error Log contains a revolving list of the errors that occur in the operation of the audiometer software. Check this list when troubleshooting. As new errors occur, they are added, and the oldest ones drop out. The errors are listed together with the date and time they occurred.

To see the Error Log:

1. From the Help menu in the Control Window, choose Error Log.
   The Error Log Viewer appears.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

User's Manual PDF File

Printed Documentation

Printed documentation can be generated using the manual.pdf file on the CD containing the audiometer software. This file can be viewed and printed with Adobe Acrobat Reader, version 5 or later.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Control Window

Control Window

All audiometer functions are controlled by the menus and the toolbar displayed at the top of the Control Window. In this section, each menu and button function is described, and a section reference is given for a full description of operation.

Menu Functions

The menu functions are described in the tables below. The column at right lists sections for further reference.

Menu	Menu Item	Functions	Section
File	Company **	Company information.	Companies
	Daily Calibration *	Access to daily calibration storage.	Daily Calibration Storage
	Languages	View or make changes to languages for automatic voice instructions.	Languages
	Passwords	Controls access using passwords.	User Names and User Passwords
	Extract *	Makes a copy of a subset of the database.	Extracting Records: An Overview
	Merge *	Merges a copy of a subset of the database into the database	Merging Records: An Overview
	Extract Configurations *	Specifies which data will be extracted.	Extract Configurations
	Merge Configurations *	Specifies which file database or SQL database will be merged; also allows for trial merge.	Merge Configurations
	Import *	Imports data.	Import Overview
	Export *	Exports data.	Export Overview

Copyright 2008 SRMi Consulting, LLC

	Formats *	Choose or create a format for importing and exporting.	Formats for Importing and Exporting
	Export Filters *	Apply a filter to data for export.	Export Filters
	Backup **	Backs up stored data.	Backing up Records: An Overview
	Restore **	Restores backed-up data.	Restoring Records: An Overview
	Exit	Ends your testing session.	N/A
Edit **	Find **	Finds a subject.	Finding a Subject
	Add **	Adds a subject or audiogram; adds a history (Plus Package only).	Subjects Audiograms Subject History
	Modify **	Modifies a subject or audiogram; modifies a history (Plus Package only).	Modifying a Subject Modifying an Audiogram Modifying a History
	Delete **	Deletes a subject or audiogram; deletes a history (Plus Package only).	Deleting a Subject Deleting an Audiogram Deleting a History
	Delete All **	Deletes all subjects in a company or all audiograms for a subject. (Plus Package Only) Deletes all histories for a subject.	Deleting a SubjectDeleting_a_Subject Deleting an AudiogramDeleting_an_Audiogram Deleting a HistoryDeleting_a_History
View *	Refresh *	Shows the latest data entered by all users.	Viewing the Work of Other Users
Report **	Print **	Choose the report template and select/sort options.	Reports
	Modify Letter *	Modifies the Notification Letter.	Modifying the Notification Letter
	Options *	Make changes to	Report Options

Copyright 2008 SRMi Consulting, LLC

		report templates and select/sort options.	
Audiometer	Assign Subject ***	Assigns a subject.	Assigning a Subject
	Save/Print Test ***	Saves and/or prints the test for selected audiometer(s).	Saving an Audiogram
	Start Test	Starts an automatic test in selected audiometer(s).	Audiometer Control Functions
	Stop Test	Pauses test in selected audiometer(s).	Audiometer Control FunctionsAudiometer_Control_Functions
	Clear	Clears subject and test data from selected audiometer(s).	Audiometer Control FunctionsAudiometer_Control_Functions
	Microphone On	Enables talk-over microphone in selected audiometer(s).	Audiometer Control Functions
	Microphone Off	Disables talk-over microphone in selected audiometer(s).	Audiometer Control Functions
	Mark	Marks an ear and frequency to automatically retest.	Audiometer Control Functions
	Manual	Places an audiometer in manual testing mode.	Manual Testing
	Play Instructions	Plays a selected voice instruction in selected audiometer(s).	Playing Voice Instructions
	Alarm Off †	Turns off the alarm.	Audiometer Control Functions
	Setup	Enter information on alarms and other features, number of audiometers, sound level meter	Audiometer SetupAudiometer_Setup

Copyright 2008 SRMi Consulting, LLC

		mapping, and computer port used.	
	Test Configuration	Check or alter the automatic test feature selection and sound level meter permissible levels.	Test Configuration Dialog Box
	Functional Check	Audiometer functional check.	Audiometer Functional Check
	Daily Calibration	See next section.	
	Annual Calibration ††	Sets up for annual calibration.	Annual Calibration of the Audiometer
	Sound Level Meter Annual Calibration ††	Sets up for sound level meter annual calibration.	Sound Level Meter Annual Calibration
Help	Contents	Shows online help topics.	N/A
	Search	Searches online help by keyword.	N/A
	Error Log	Shows revolving error log for troubleshooting.	Error Log
	About	Program version information.	N/A

* Available only if the Plus Package hardware key is installed.

** Available only with Database Interface set to Storage.

*** Available only with Database Interface set to Storage, OHM, HearTrak (Windows), or Medgate.

† Appears only if you have chosen the Test Complete Alarm or Error Alarm to be 'Continuous' in the Setup dialog box.

†† Appears only if the calibration hardware key is installed.

Daily Calibration Submenu

The Daily Calibration submenu under the Audiometer menu is described in the table below. The column at right provides a section for further reference.

Menu	Menu Item	Functions	Section

Copyright 2008 SRMi Consulting, LLC

Daily Calibration	Set	Sets the Daily Calibration indicator for selected audiometer(s).	Daily Calibration Check using the Bio-Acoustic Simulator
	Clear	Clears the Daily Calibration indicator for selected audiometer(s).	Daily Calibration Check using the Bio-Acoustic Simulator
	Save/Print	Print the daily calibration test; update reference audiogram; access to Save/Print Options. (Plus Package only:) Saves the daily calibration audiogram in Daily Calibration Storage.	Save/Print Daily Calibration dialog box
	Configuration	Choose or alter the test configuration for daily calibration.	Daily Calibration Configuration

Toolbar

The toolbar is at the top of the Control Window. The nine toolbar buttons and their functions are described in the tables below. For more information on how to use a given button, see the topic referenced in the last column.

Button Name	Function	Section
Find Subject **	Finds a subject by Social Security number.	Finding a Subject
Add Subject **	Adds a subject.	Subjects
Modify Subject **	Modifies a subject.	Modifying a Subject
Delete Subject **	Deletes a subject.	Deleting a Subject
Add Audiogram / Add History **	Adds an audiogram; adds a history if Histories Tab is selected (Plus Package only).	Audiograms Subject History
Modify Audiogram / Modify History **	Modifies an audiogram; modifies a history if Histories Tab is selected (Plus Package only).	Modifying an Audiogram Modifying a History
Delete Audiogram / Delete History **	Deletes an audiogram; deletes a history if Histories Tab is selected (Plus Package only).	Deleting an Audiogram Deleting a HistoryDeleting_a_History
Print Reports **	Allows you to print a report	Reports

Copyright 2008 SRMi Consulting, LLC

	using select/sort options.	
 Assign Subject (F2) *	Selects a subject for selected audiometer(s).	Assigning a Subject
 Save/Print Test (F3) *	Saves test data to subject record to selected audiometer(s).	Saving an Audiogram
 Start Test (F4)	(Re-)starts an automatic test to selected audiometer(s).	Audiometer Control Functions
 Stop Test (F5)	Pauses test to selected audiometer(s).	Audiometer Control Functions
 Clear (F6)	Clears subject and test data from selected audiometer(s).	Audiometer Control Functions
 Microphone On (F7)	Enables talk-over microphone to selected audiometer(s).	Audiometer Control Functions
 Microphone Off (F8)	Disables talk-over microphone to selected audiometer(s).	Audiometer Control Functions
 Manual (F9)	Places an audiometer in manual testing mode.	Audiometer Control Functions
 Alarm Off † (F10)	Turns the alarm off that sounds when the test is complete or when an error occurs.	Audiometer Control Functions

* Available only with Database Interface set to Storage, OHM, or MedGate.

** Available only with Database Interface set to Storage.

† Appears in the toolbar only if you have chosen the Test Complete Alarm or Error Alarm to be 'Continuous' in the Setup Audiometer dialog box.

Tool Tips

The toolbar buttons display on-screen descriptions when the mouse pointer pauses on them. These descriptions, called Tool Tips, give the button function and associated function key, if applicable.

Delete All

"Delete All" is a command that can be applied to subjects, audiograms, etc. However, the Delete All command, which is a menu item and a push button in some dialog boxes, includes safeguards so that important data is not inadvertently deleted. First, choosing Delete All causes a confirmation dialog box to appear, in which you must choose Yes in order to continue with the deletion. Second, the Delete All Final Confirmation dialog box appears, in which you must type the words "DELETE ALL" in an edit box in order for the data to be deleted. This operation cannot be undone.

Copyright 2008 SRMi Consulting, LLC

To delete all subjects or audiograms, choose Delete All from the Edit menu in the Control Window, then choose Subjects or Audiograms from the submenu.

This procedure is also described in the sections on Deleting an Audiogram, Deleting a Subject, etc.

PLUS PACKAGE ONLY

To delete all histories, choose Delete All from the Edit menu in the Control Window, then choose Histories from the submenu.

Individual and Group Control

Most toolbar functions may be selected for all audiometers or a single audiometer. If you are controlling more than one audiometer, the Select Audiometer dialog box will appear after the toolbar button is pressed.

Enabling an Audiometer

In addition, the Select Audiometer dialog box allows you to choose whether or not an audiometer is enabled. This feature works with the All Enabled Audiometers button to allow you group control over the audiometers that are enabled. For a variety of reasons, you may wish to temporarily disable one or more audiometers in the installation for a long period of time (for instance, a 10-audiometer van that receives groups of 8 subjects at a time may wish to disable 2 audiometers). Simply click the check box next to the Enabled box for that audiometer (the check will disappear) and the audiometer is not enabled for the rest of the testing session.

Audiometer Context Menu

An alternate method of controlling the audiometer functions is with the Audiometer Context Menu. This menu appears when the mouse pointer is over an audiometer's Test Display area (exclusive of the Name/ID/SSN edit box) and the mouse's right button is clicked. The menu items will vary depending on which database interface you are using. If you are using Storage, OHM, FOSHM, Systoc, HearTrak (Windows), or MedGate, 'Assign Subject' and 'Save/Print Test' will appear, whereas if you are using another database, these two items will not appear.

You may choose any of the menu item functions. See Menu Functions. The function is applied to the audiometer over which the mouse was positioned when the click occurred.

Audiometer Control Functions

This section describes in detail the functions of the Control Window buttons and menu items (in the Audiometer menu) that control the audiometer. A table of common testing tasks with instructions for performing them is included in the next section.

Copyright 2008 SRMi Consulting, LLC

Start

This button and menu item commences automatic testing in the selected audiometer(s). If the thresholds are all NT (Not Tested), the automatic test is specified in the Test Configuration List dialog box (see Choosing an Automatic Test Configuration). If one or more frequencies are marked for automatic retest (indicated by inverse coloring of display), those frequencies will be tested first in order from left to right. This is followed by testing of all frequencies without thresholds in order from left to right. This button also restarts an automatic test that was stopped with Microphone On/Off.

Stop

This button and menu item stops the automatic test in the selected audiometer(s) if the audiometer status is Testing or Keep Busy. Otherwise this button has no effect. When the test is stopped, you can restart the test with no loss of the thresholds that have been determined.

Clear

This button and menu item stops testing, removes all marks for retest, and clears the subject from the audiometer to make it ready for testing a new subject. If talk-over was in use on the selected audiometer(s), it is disabled. Clear also removes Other Ear First and Continuous Tone selections from audiometers.

Microphone On/Microphone Off

These buttons and menu items enable and disable the talk-over microphone to the selected audiometer(s), respectively. Use talk-over to communicate with subjects in the sound booth. If an automatic test was in progress when the button is pressed, the test is first stopped before the talk-over is enabled. The audiometer is left idle after talk-over is disabled. Use Start to restart an automatic test that was stopped with Microphone On/Off.

Mark [for Retest]

This menu item allows the marking of given ear and frequency for automatic retesting. If an automatic test is in progress when the frequency is marked, the retest occurs after all frequencies have been tested. If the audiometer status is idle, the retest occurs immediately after the Start button is pressed. If the audiometer status is Keep Busy, the retest occurs after the audiometer is stopped (Stop button) and restarted with the Start button. The retests are handled in order from left to right on the display.

Even if a frequency that was marked for retest had a previously determined threshold, the threshold that is determined during the retest is the one that is retained.

Copyright 2008 SRMi Consulting, LLC

Manual

This button and menu item controls the selected audiometer like a manual audiometer. See Manual Testing .

Play Instructions

This menu item allows you to play the voice instruction of your choice. See Playing Voice Instructions .

Alarm Off

This button and menu item turns off the alarm that sounds when a test is complete or when an error occurs. 'Alarm Off' appears as a toolbar button and menu item only if you have chosen the Test Complete Alarm or the Error Alarm to be 'Continuous' in the Setup dialog box.

Instructions for Mouse and Keyboard

The following tables list common audiometer functions in the left column and tells how to perform these functions in the right column with either the mouse or the keyboard. Many users feel most comfortable using the mouse when learning to use a program, but find that the flow of the program is much quicker when using the keyboard because of the time involved in pointing the mouse to various points on the screen.

In the tables below, the symbol represents instructions for performing the task with the mouse and the symbol represents keyboard instructions.

To (re-)start an automatic test:		Click the Start button. If controlling multiple audiometers, click on the audiometer number or All Enabled Audiometers button to start all audiometers.
		Press F4. If controlling multiple audiometers, type the number of the audiometer (e.g. '2' for audiometer number two) or 'A' to start all audiometers.
To stop or pause the test:		Click the Stop button. If controlling multiple audiometers, click on the audiometer number or All Enabled Audiometers button to stop all audiometers.
		Press F5. If controlling multiple audiometers, type the number of the audiometer or 'A' to stop all audiometers.
To clear a booth:		Click the Clear button. If controlling multiple

Copyright 2008 SRMi Consulting, LLC

		audiometers, click on the audiometer number or All Enabled Audiometers button to clear all audiometers.
		Press F6. If controlling multiple audiometers, type the number of the audiometer or 'A' to clear all audiometers.
To automatically retest a given ear/freq. at the end of an auto-test:		Position the mouse over the frequency to be retested and click. The display will turn inverse (white characters on black background).
		Type alt-A followed by 'K', which chooses Mark from the Audiometer menu. If controlling multiple audiometers, click on the audiometer number or All Enabled Audiometers button to retest all audiometers. Type 'L' for left ear or 'R' for right ear. Type the first numeral of the frequency to retest (e.g. '6' for 6kHz).
To automatically retest a given ear/freq. immediately:		Position the mouse over the frequency to be retested and click. The display will turn inverse. Stop the test and re-start using the procedures above.
		Type alt-A followed by 'K', which chooses Mark from the Audiometer menu. If controlling multiple audiometers, click on the audiometer number or All Enabled Audiometers button to retest all audiometers. Type 'L' for left ear or 'R' for right ear. Type the first numeral of the frequency to retest (e.g. '6' for 6kHz). Stop the test and re-start using the procedures above.
To manually (re)test a subject:		Click the Manual button. If controlling multiple audiometers, click on the audiometer number.
		Press F9. If controlling multiple audiometers, type the number of the audiometer.
To use the talk-over microphone:		Click the Microphone On button. If controlling multiple audiometers, click on the audiometer number or All Enabled Audiometers button to talk to all audiometers. To turn off the microphone, click the Microphone Off button. If controlling multiple audiometers, click on the audiometer number or All Enabled Audiometers button to turn off the

Copyright 2008 SRMi Consulting, LLC

		microphone to all audiometers.
		Press F7. If controlling multiple audiometers, type the number of the audiometer. To turn off the microphone, press F8. If controlling multiple audiometers, type the number of the audiometer or 'A' to turn off all audiometers.
To turn the alarm off:		Click the Alarm Off button.
		Press F10.

Test Display

The on-screen display gives information on status, test progress, and subject name (or ID, SSN depending on the option selected). When controlling multiple audiometers, this information is displayed for each audiometer. The five display columns are described below.

Column	Description	
Aud #	Audiometer number (1-16)	
Name/ID /SSN	Displays name of subject if a subject has been assigned. You may choose to display subject ID number or Social Security number. See Audiometer Setup.	
Left	Displays test data or progress by frequency for the left ear.	
	Number (black)	Threshold in dB HTL
	Number (red)	current stimulus in dB HTL being presented. This display can be used to watch the bracketing in progress to assure that the subject understands the test.
	NT	No test. Indicates that a frequency has not been tested, or was not selected for test.

Copyright 2008 SRMi Consulting, LLC

	NR	No response. The subject did not respond to two stimulus presentations at the maximum intensity.
	MR	Multiple response. The subject responded twice or more to a single stimulus presentation.
	SE	Subject error. A threshold was not determined in 20 stimulus presentations.
	CR	Continuous response. The hand switch was not released since the start of the previous stimulus presentation.
	RN	Retest not valid. The threshold of the programmed retest varies by more than 5 dB.
	PT	Presentation time-out. More than sixty seconds have elapsed from the start of a threshold determination without a threshold being established.
Right	Displays test data or progress by frequency for the right ear. See above for explanation of contents.	
Status Help	Displays current audiometer status. One of eight messages is displayed:	
	Idle	not testing
	Testing	automatic test in progress
	Finished	automatic test is complete
	Error	an error occurred during automatic testing

Copyright 2008 SRMi Consulting, LLC

Keep Busy	test is complete and the subject is being kept busy (see Keep Busy)
Noise*	sound level meter indicates noise exceeds permissible level
Mic On	talk-over microphone is enabled
Instruction	voice instructions are being given

The small column to the left of the Status Help column will contain an asterisk (*) character if the information has not been saved, or has been modified since the last save.

*Appears only with the Retest on Noise Above MPANL check box selected in the Test Configuration dialog box.

Audiometer Information Tabs

The audiometer information tabs display additional information about a particular audiometer. Each audiometer has its own tab at the bottom of the Control Window. To learn more about the information tab fields, see Information Tab Fields, below.

Information Tab Fields

Daily Calibration

If this check box is checked, the audiometer software uses the selected Daily Calibration Configuration for testing. Selecting 'Set' in the Daily Calibration submenu (in the Audiometer menu in the Control Window) checks the box, or you may check the box in the Audiometer Information Tab. For more information on daily calibration, see Daily Calibration.

This check box will be cleared when the audiometer is cleared with the Clear command.

Other Ear First

If this check box is selected, the audiometer will perform the selected Test Configuration swapping the right and left ears. Clear this check box to perform the test on the left and right ears in the standard order.

This check box will be cleared when the audiometer is cleared with the Clear command.

Copyright 2008 SRMi Consulting, LLC

Pulse Tone

If this check box is selected, the subject is tested using a pulsed stimulus. Clear this check box to use a continuous stimulus for this audiometer.

Following a Clear command, the contents of this check box are determined by the current Test Configuration.

STS

The audiometer's information tab indicates whether the subject has experienced an STS for the current audiogram. For the definition of STS, see the sections beginning with Standard Threshold Shift (STS). The method used for determining STS is determined by what has been selected for the 'STS Method' combo box in the Test Configuration dialog box.

STS is indicated by two check boxes and two edit boxes, one each for left and right ears. If the STS L check box is checked, the subject has experienced an STS in the left ear relative to the baseline audiogram. Similarly, if the STS R check box is checked, the subject has experienced an STS in the right ear.

The edit boxes to the right of the STS L and STS R labels contain the average difference between thresholds at 2k, 3k, and 4kHz for the current audiogram and baseline audiogram for the left and right ears, respectively. A positive value in this field indicates hearing loss at these frequencies. A negative value in this field indicates that hearing has improved for these frequencies relative to the baseline audiogram.

The information tabs will indicate STS only if a valid baseline audiogram is available.

Instruction Language

Allows a different instruction language for an individual booth. Following a Clear command, this control is reset to the language specified in the selected Test Configuration. See General Tab (Test Configuration).

Baseline Audiogram

The baseline audiogram thresholds are displayed if a baseline audiogram is available. If no baseline audiogram is available, all fields will indicate 'not tested' (NT).

Status Help

The Status Help box displays the current audiometer status (i.e., idle, testing, error, etc.). If an error occurs, this box contains a description of the error (e.g. 'No release of response switch'), the ear and frequency where the error occurred, and instructions for training the subject. The Status Help box displays 'Noise' if the Sound Level Meter determines that the maximum permissible ambient noise levels (MPANLs) have been exceeded.

Copyright 2008 SRMi Consulting, LLC

Audiogram Graph

Graphs displaying the audiogram thresholds for the left and right ears appear in the Audiometer Information Tab.

The user may choose to display or hide these graphs as described in Audiometer Setup.

Viewing Information Tabs

To view the information tab of an individual audiometer:

- Click the mouse over the tab

  -or-

- Click the mouse on the Audiometer number or Status column of the audiometer's test display

  -or-

- Use the accelerator keys (i.e. typing alt-1 selects the audiometer 1 information tab).

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Automatic Testing

Standard Test Configurations

Standard test configurations are programmed into the audiometer software. To see them, choose Test Configuration under the Audiometer menu. The two standard test configurations are: Standard Test, which presents tones from 500k to 6000k, and Standard Test w/8kHz, which presents tones from 500k to 8000k. 'Standard Test' does not test 8000 Hz. If you wish to test 8000 Hz, choose 'Standard Test w/8kHz'.

Test configuration features are described in the following sections.

Test Configuration Dialog Box

The Test Configuration dialog box has five tabs, described in the following sections. To see the Test Configuration dialog box, choose Test Configuration under the Audiometer menu, and select the Add push button.

- General Tab: settings for automatic testing.
- Test Sequence Tab: settings for presentation of tones during testing.
- Automatic Retest: choices for conditions under which subjects should be automatically retested.
- Wait Intervals: amount of time between a response and the presentation of the next stimulus.
- MPANLs (appears only if a Sound Level Meter is installed): Maximum Permissible Ambient Noise Levels.

General Tab (Test Configuration)

The first tab in the Test Configuration dialog box is the General Tab, described in the following sections. To see the Test Configuration dialog box, choose Test Configuration from the Audiometer menu, and choose the Add push button.

The features and selections for automatic testing that are found in the General Tab are described in the following sections.

Languages for Voice Instructions

The Language combo box on the General page of the Test Configuration dialog box sets the language that is used for voice instructions. The audiometer software can automatically play pre-recorded voice instructions over the headset to instruct the subject when the test starts and when an error occurs. The languages available for automatic voice instructions are English, Spanish, French, German, Vietnamese, Bosnian, Russian, Somali, Hmong, Hindi, Cambodian, Tibetan, Italian, Japanese, Polish, and Tagalog.

Copyright 2008 SRMi Consulting, LLC

The language selected as part of a subject's demographic data (in the Add Subject or Modify Subject dialog box) overrides the language of the chosen Test Configuration, as long as the subject has been assigned.

The language being used for testing appears in the audiometer information tab in the Instruction Language combo box. You may change the language in this combo box at testing time. Following a Clear command, this control is reset to the language specified in the current Test Configuration.

You can record the instructions in a new language of your choice. To add a language, see Adding a Language.

For the texts, see the sections beginning with Start Test Voice Instructions.

For information on playing voice instructions, see Playing Voice Instructions.

For information on setting the volume for voice instructions, see Volume for Instructions and Microphone.

Threshold Determination

The Procedure combo box in the General page of the Test Configuration dialog box sets the procedure for determining hearing thresholds. The options available are 'Modified Hughson-Westlake' or 'Screening.'

If you chose 'Modified Hughson-Westlake' as the Procedure:

The hearing threshold at a frequency is defined as the lowest level at which a response occurs in at least half of the ascending trials, with a minimum of two out of three, or two consecutive responses at a single level.

To determine a threshold the audiometer software presents a tone at the Start level specified in the Test Configuration dialog box for the ear and frequency. If no response is recorded, the stimulus level increases by 20dB until a response is obtained, unless a Historical Starting Level (HSL) has been enabled for this ear and frequency. If Initial Response Confirmation is selected, the stimulus is again presented at that level to confirm the response.

After the response is confirmed, the audiometer software follows the modified Hughson-Westlake procedure (10dB down, 5dB up) until a threshold is determined as defined above.

If a subject is assigned after the test starts, Historical Starting Levels will be used for all threshold determinations that occur after the subject is assigned.

If you chose 'Screening' as the Procedure:

The hearing threshold at a frequency is defined as the level at which a response occurs in the first ascending trial.

To determine a threshold the audiometer software presents a tone at the Start level specified in the Test Configuration dialog box for the ear and frequency. If no

Copyright 2008 SRMi Consulting, LLC

response is recorded, the stimulus level increases by 5dB until a response is obtained. This frequency is recorded as the threshold. Alternatively, if the subject provides two consecutive responses at the lowest level, this level is recorded as the threshold.

The audiometer software lowers the intensity by 5dB when the subject responds, and increases the intensity by 10dB if the subject does not respond, until a threshold is determined.

The lowest level of stimulus to present is selectable for each threshold. See Test Sequence Tab (Test Configuration) for an explanation of the starting and lowest levels.

Real-Time STS Calculation

During the audiogram, the audiometer software calculates STS according to the method specified for the current test configuration in the STS Method combo box. A baseline audiogram must be available from the database for the subject in question. If there is an STS, it will be noted in the subject's data only if the audiogram is saved.

The available methods are OSHA/MSHA STS w/o age correction, OSHA/MSHA STS w/ age correction, and DOD Significant Threshold Shift. STS refers to Standard Threshold Shift, which has been defined by both OSHA and MSHA. See the sections beginning with Standard Threshold Shift (STS).

Automatic Assign, Save, and Clear check boxes

The features described in this section depend partly on which Database Interface has been selected in the Setup dialog box. If Storage, OHM, FOSHM, Systoc, HearTrak (Windows), or MedGate has been selected, the Assign dialog box and the Save/Print Test dialog box will appear, whereas if you are using another database, these two dialog boxes will not appear.

If the Automatic Assign on Start check box is selected for the test configuration, the Assign dialog box will appear when testing begins.

If the Automatic Save on Test Complete check box is selected, the Save/Print Test dialog box will appear when a test is finished.

If the Automatic Clear on Test Save check box is selected, the current test will be automatically cleared from the audiometer when the test is saved.

Variable Starting Level

When performing a large number of tests, the time needed to complete each test is a major consideration. One way to reduce the time needed to complete an automatic test with the audiometer is to use a variable starting level in determining each threshold. Rather than presenting the initial stimulus of a threshold determination at a predetermined level, the audiometer will begin at a level relative to the previous

Copyright 2008 SRMi Consulting, LLC

threshold set by the VSL setting in the Test Configuration dialog box. For more information on how Variable Starting Level is handled in testing, see Test Sequence Tab (Test Configuration). Except in cases of abnormal hearing loss, this feature reduces the overall duration of the test considerably.

Values for VSL may be from -20 to 20dB inclusive in steps of 5. It is generally advisable to choose a positive value for VSL (stimulus starts higher than previous threshold) so that the subject will be less likely to miss the initial stimulus and lengthen the test time. Presenting the initial stimulus at the level of the previous threshold (VSL = 0) will likely result in the subject not responding about half the time.

If VSL is selected for the first threshold determination, or for a threshold determination after an error, the starting intensity will be 40dB HTL.

Terminate Stimulus on Response (TSOR)

This feature will cause the audiometer to stop presenting the stimulus immediately when the subject presses the response switch and begin the waiting period between presentations. Selecting this feature has the potential to reduce the testing time a fraction of a second for each tone presentation. At an expected 3 to 10 presentations per threshold, the potential time savings are significant.

Initial Response Confirmation

The stimulus to which the subject first responds in an ascending trial of a threshold determination is repeated. If the subject responds to the repeated stimulus, the test continues normally; otherwise, the stimulus intensity increases by 5 dB until the subject responds again. That response is again confirmed.

Some users may feel that Initial Response Confirmation adds to the test validity because it ensures that the threshold determination began in audibility. However, because Initial Response Confirmation adds tone presentations to the audiogram, the amount of time needed to complete the audiogram is increased.

Initial Response Confirmation has no effect when the Procedure is set to be 'Screening' in the Test Configuration dialog box.

Pulse and Continuous Stimulus

The audiometer can present a pulse or continuous stimulus. A pulse stimulus is three short beeps of 200ms duration with 200ms between pulses. Pulse tone can often allow subjects with tinnitus to distinguish the stimulus from 'ringing in the ears.' Continuous stimulus is a single tone of one-second duration.

Keep Busy

When testing multiple subjects in a common area (e.g. a group sound booth), a subject who completes the automatic test before the others may be disruptive to the

Copyright 2008 SRMi Consulting, LLC

other subjects' concentration. In Keep Busy mode, the audiometer continues to present tones after the automatic test is finished, but does not save new thresholds. Since the subject continues to hear tones, he or she will not know that the test is completed and will be less likely to bother other subjects.

Start Test Voice Instructions

The 'Start Test Voice Instructions' check box in the Test Configuration dialog box sets an automatic voice instructions to play at the start of the test.

Below is the text of the Start Test voice instructions in English. If another language has been chosen, a translation of these instructions into that language is used.

Start Test

"This is a hearing check. You will be listening for some tones. When you hear a tone, press the button once and quickly release the button. No matter how faint the tone, press the button when you hear a tone and quickly release the button. Upon completion of your hearing check, please remain seated and quiet until the operator releases you."

Error Handling

An error is an indication that the test may be producing inaccurate results. Potential sources of these inaccuracies are subject errors in following instructions (e.g. not releasing the response switch), or trying to 'outsmart the test' (e.g. randomly pressing the response switch). An error may also result when a programmed retest of a frequency yields a result that varies significantly from the original threshold.

The audiometer software has several reactions to an error. First, the technician is notified of the error by the appearance of an error code in that ear and frequency in the booth's test display. Next, the type of error, the description, and instructions for counseling the subject are placed in the booth's information tab (see Audiometer Information Tabs). Optionally, automatic voice instructions are played over the subject's headset.

See the next section for information on what causes specific errors to be generated.

You can choose to have the test stop immediately after any kind of error by choosing 'Stop Test on Error' in the Test Configuration dialog box. See General Tab (Test Configuration).

INSTRUCTION TEXTS

Below is the text of the error voice instructions in English. If another language has been chosen, a translation of these instructions into that language is used.

No response (NR)

"You are not pushing the hand switch when you hear the tone. I will restart the test; remember to push and release the hand switch as soon as you hear the tone."

Copyright 2008 SRMi Consulting, LLC

Multiple Response (MR)

"You are pushing the hand switch when no tone is present. Be sure you hear the tone and press and release your hand switch quickly."

Subject Error (SE)

"Press and release the hand switch button as soon as you hear a tone, even if the tone is very soft."

Continuous Response (CR)

"You are not releasing the hand switch quickly enough. Remember to press and release the hand switch quickly, as soon as you hear the tone."

Retest Not Valid (RN)

"Press and release the hand switch button as soon as you hear a tone, even if the tone is very soft."

Presentation Timeout (PT)

"Press and release the hand switch button as soon as you hear a tone, even if the tone is very soft."

Error Descriptions

An error is generated when one of the following conditions occurs:

Common name	Error code	Description
No Response	NR	The subject did not respond to two stimulus presentations at the maximum intensity.
Multiple Response	MR	The subject responded more than once to a single stimulus presentation.
Subject Error	SE	A threshold was not determined within twenty stimulus presentations.
Continuous Response	CR	The response switch was not released since the start of the previous stimulus presentation.
Retest Not Valid	RN	The threshold of a programmed retest varies by more than 5 dB.
Presentation Timeout	PT	More than sixty seconds have elapsed from the start of a threshold determination without a threshold being established.

Copyright 2008 SRMi Consulting, LLC

Playing Voice Instructions

Automatic voice instructions are set to play at the appropriate times in the General page of the Test Configuration dialog box. You may also play a voice instruction at any time by following the instructions below.

To play a voice instruction:

1. Under the Audiometer menu in the Control Window, choose Play Instructions. The Play Instruction dialog box appears.
2. Choose the instruction you wish to play.
3. When finished with the Play Instruction dialog box, choose Cancel.

Stop Test on Error

The behavior of this feature in the Test Configuration varies depending on the setting of the Error Voice Instructions check box. When the Stop Test on Error check box is checked and the Error Voice Instructions box is not checked, the test will be stopped when one of the following error situations occurs:

- Continuous Response or Multiple Response (see Error Descriptions).
- a No Response error on the first frequency tested.
- two No Response errors if neither occurs during the first frequency tested.

An alarm will also sound if the error alarm has been enabled in the Setup dialog box.

If both the Error Voice Instructions check box and the Stop Test on Error check box are checked, the test is stopped and an automatic voice instruction is delivered for the situations described above.

If the Stop Test on Error box is not checked, the test sequence will respond to errors as described in Error Handling.

Retest on Noise Above MPANL

The sound level meter that is mapped to the audiometer may determine that the ambient noise level for the current stimulus and response exceeded the Maximum Permissible Ambient Noise Level (MPANL). If the 'Retest on Noise Above MPANL' check box is checked, the Status column in the Test Display indicates 'Noise', the current stimulus and response are disregarded, and the stimulus is presented again. If the ambient sound level is now below the maximum permissible level, the test continues normally. However, if the ambient noise continues to be above permissible levels, the stimulus is repeatedly presented, but no responses are recorded. If more than sixty seconds elapse from the start of the threshold determination without a response being recorded, there is a Presentation Timeout error. See Error Descriptions.

Copyright 2008 SRMi Consulting, LLC

If this check box is selected, the fact that it was selected is saved with the audiogram when the audiogram is saved. The MPANLs will also be saved with the audiogram.

For this setting to have an effect, the Sound Level Meter that is taking the readings must be mapped to the audiometer performing the test. Mapping is done in the Sound Level Meter Mapping tab in the Setup dialog box. See Configuring the Sound Level Meter.

If the 'Retest on Noise Above MPANLs' check box is not checked, the test will continue normally even if the sound level meter measures sound levels that exceed the MPANLs.

MPANLs are set in the MPANLs tab of the Test Configuration dialog box. See MPANLs.

This setting has no effect if a Sound Level Meter is not installed in the system.

Semi-Automatic Manual Mode

When this box is checked for the Test Configuration, the audiometer will automatically detect whether the subject has given a response that is within the valid response windows, and will adjust the dB level of the next stimulus accordingly. If the subject has given no response, the dB level is automatically set 5dB higher, whereas if the subject has given a response, the dB level is set 10dB lower. The audiometer will determine the threshold for the given frequency according to a modified Hughson-Westlake procedure. See Threshold Determination.

The push buttons 'Set NR' (Set No Response) and 'Set Threshold' do not appear in the Manual dialog box when this box is checked, since the audiometer determines whether the subject responds and what the threshold is.

Semi-Automatic Manual Mode is set in the Test Configuration dialog box. See General Tab (Test Configuration) .

Prohibit Audiogram without Sound Level Meter Calibration

If the 'Prohibit Audiogram without Sound Level Meter Annual Calibration' check box is selected in the Test Configuration, the user will be unable to start a booth if the date of last annual calibration for the sound level meter is more than one year prior to today's date.

In addition, a warning can be displayed at the start of the audiogram if the sound level meter will need calibration within a number of days from today's date. To set this number, see Audiometer Setup.

If you wish to test but are being prohibited from doing so, and you have already unselected this check box, you may want to check the selected Daily Calibration Configuration to see whether this feature is enabled there. See Daily Calibration Configuration.

Copyright 2008 SRMi Consulting, LLC

Prohibit Audiogram without Annual Calibration

If the 'Prohibit Audiogram without Audiometer Annual Calibration' check box is selected in the Test Configuration, the user will be unable to start a booth if the date of last annual calibration for that booth is more than one year prior to today's date.

In addition, a warning can be displayed at the start of the audiogram if the booth will need calibration within a number of days from today's date. To set this number, see Audiometer Setup.

If you wish to test but are being prohibited from doing so, and you have already unselected this check box, you may want to check the selected Daily Calibration Configuration to see whether this feature is enabled there. See Daily Calibration Configuration.

Prohibit Audiogram without Functional Check

If the 'Prohibit Audiogram without Audiometer Functional Check' check box is selected in the Test Configuration, the user will be unable to start a booth until a functional check has been completed on that booth today.

If you wish to test but are being prohibited from doing so, and you have already unselected this check box, you may want to check the selected Daily Calibration Configuration to see whether this feature is enabled there. See Daily Calibration Configuration.

Prohibit Audiogram without Daily Calibration

If the 'Prohibit Audiogram without Audiometer Daily Calibration' check box is selected in the Test Configuration, the user will be unable to start a booth until a daily calibration has been performed on that booth today.

Test Sequence Tab (Test Configuration)

The Test Sequence Tab is in the Test Configuration dialog box. This page shows the test sequence that will be presented to the subject for this test configuration. To see the Test Configuration dialog box, choose Test Configuration from the Audiometer menu, and select a test configuration from the list.

- The Ear column specifies which ear to test (Left or Right).
- The Freq column specifies the test frequency. The frequencies range from 500 to 8kHz.
- The Start column is the level of the initial stimulus at that frequency in dB HTL, or VSL (Variable Starting Level). A value in the HSL field overrides this setting if a subject has been assigned and a previous audiogram for this person is available to the audiometer software.
- The Low column specifies the lowest level in dB HTL that you want the audiometer to present, and hence the lowest threshold that can be determined.

Copyright 2008 SRMi Consulting, LLC

- HSL specifies the Historical Starting Level (HSL) .

This page can be used to program a retest of one or more frequencies. See Programmed Retests .

Historical Starting Level (HSL)

Similar to Variable Starting Level, the Historical Starting Level (HSL) feature reduces the time needed to determine a threshold, but does so by using the stored history of the subject to be tested. The initial stimulus is presented a specified level above (positive HSL) or below (negative HSL) the threshold of the previously stored audiogram. For example, if the threshold for left ear 1kHz of the previous audiogram was 15dB HTL, an HSL of 10 will present the first tone at 25dB (10 plus 15). Choosing an HSL of 5 or 10 dB above the previous audiogram will normally reduce the number of presentations needed and hence the test length, even in cases of abnormal hearing loss.

The first tone presentation of an automatic test should be loud enough to get the subject's attention and signal that the test has begun. It is recommended that the HSL for the first threshold determination be +20 or not selected (i.e., defaults to Start dB value) to provide this 'wake-up call.'

If the subject does not respond to the initial stimulus, the stimulus level increases by 5dB until a response is obtained, if Historical Starting Level has been enabled for that ear and frequency.

The Historical Starting Level is used if a subject has been assigned and a previous audiogram for this person is available to the audiometer software.

To enable Historical Starting Level(s), choose a value from the HSL combo box for a given ear and frequency in the Test Sequence tab of a test configuration.

If a subject is assigned after the test starts, Historical Starting Levels will be used for all threshold determinations that occur after the subject is assigned.

Programmed Retests

The automatic test sequence can be programmed to automatically retest one or more frequencies.

To program a retest of a frequency:

1. Choose Test Configuration from the Control Window Audiometer menu.
2. Choose the Test Sequence tab.
3. Modify the test sequence so that the same ear and frequency appear in two rows. Be certain that the two lines have the same Low dB setting. Otherwise, the booth may always generate an error in certain circumstances.

   When the original threshold and the retest results are different, the audiometer software uses the rules below to determine which result is retained:

Copyright 2008 SRMi Consulting, LLC

- If both results were thresholds, the better of the two thresholds is retained.
- If one result is an error and one a threshold, the threshold is retained.
- If both results were errors, the last error is retained.

A retest threshold that is not within 5 dB of the original threshold generates an error. See Error Handling.

Automatic Retests

At the completion of a test, the audiometer will perform an automatic retest of all thresholds that could not be determined due to subject errors. The audiometer can also be set to perform an automatic retest of all thresholds that meet the retest criteria.

To program automatic retests, use the Automatic Retest page in the Test Configuration dialog box. (From the Audiometer menu in the Control Window, choose Test Configuration.)

The audiometer can be programmed to retest a frequency if the threshold:

- could not be determined due to subject errors (see Error Descriptions for information on error codes).
- is 90dB or greater.
- is greater than 30dB at 500 Hz.
- differs from the adjacent threshold by 50dB or more. (The higher of the two thresholds is retested.)
- differs by 40dB or more from the corresponding threshold in the other ear.
- has changed more than 15dB up or down relative to the respective baseline threshold.

You can also program the audiometer to retest a frequency by using the Test Sequence tab. See Programmed Retests .

Wait Intervals

The Wait Intervals page in the Test Configuration dialog box shows the amount of time (in milliseconds) between a response and the presentation of the next stimulus, added to a minimum of 1 second wait. For example, if the wait interval is 1000, then the time between the reponse and the presentation of the next stimulus is two seconds (1 second plus 1000 milliseconds).

The values in the edit boxes can be changed by the user.

MPANLs

The MPANLs Tab is in the Test Configuration dialog box. ‘MPANLs’ stands for Maximum Permissible Ambient Noise Levels. A Sound Level Meter that is installed

Copyright 2008 SRMi Consulting, LLC

and mapped to the audiometer measures ambient noise, and with the MPANLs Tab you can define maximum permissible noise levels. The first group box shows the three possible choices for Maximum Permissible Ambient Noise Levels. There are two industry standards available: OSHA 29 CFR 1910-1983 and ANSI S3.1-1999. Custom settings can also be entered.

The setting 'None' means that there is no MPANL for that frequency.

Custom settings can also be entered by selecting the Custom radio button, then choosing the custom settings for the Sound Level Meter below in the Custom Settings group box. Accepted values are None, or between 21.0 and 62.0, inclusive.

The settings chosen here will be used as the MPANLs for the Retest on Noise Above MPANLs check box in the Test Configuration, if that check box is selected. See Retest on Noise Above MPANL for more information on that feature.

For information on mapping a Sound Level Meter to the audiometer, see Configuring the Sound Level Meter.

Choosing an Automatic Test Configuration

To choose the test configuration to use for automatic testing:

1. Select the Audiometer menu and choose Test Configuration.
   The Test Configuration List dialog box appears.
   If all audiometer booths are not in Idle status, an error is displayed.
2. Select the test configuration from the list box and choose Close.
   The selected test configuration will be used for all subsequent automatic testing.

Adding an Automatic Test Configuration

For information on the Test Configuration dialog box, see Test Configuration Dialog Box.

To add an automatic test configuration:

1. Select the Audiometer menu and choose Test Configuration.
   The Test Configuration List dialog box is displayed.
2. Choose the Add push button.
   The Test Configuration dialog box is displayed.
3. Enter your choices in the General and other pages, as applicable.
4. When finished, choose OK.

Copyright 2008 SRMi Consulting, LLC

Modifying an Automatic Test Configuration

To modify a test configuration:

1. Select the Audiometer menu and choose Test Configuration.
   The Test Configuration List dialog box appears.
2. Select the test configuration to modify in the list box and press the Modify push button.
   The Test Configuration dialog box appears.
3. Make changes as desired.
   The significance of individual settings is described in the section beginning with Test Configuration Dialog Box.
4. When all changes are made, choose OK.

Deleting an Automatic Test Configuration

To delete a test configuration:

1. Under the Audiometer menu, choose Test Configuration.
   The Test Configuration List dialog box appears.
2. Select the Test Configuration to delete and choose the Delete push button.
3. Confirm the deletion by choosing the Yes push button.

   Once a test configuration is deleted it can not be recovered and must be defined again.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Manual Testing

Manual Testing

This Control Window button and menu item (under the Audiometer menu) allows you to control the audiometer of the selected booth like a manual audiometer. You may use the manual mode to test subjects who are difficult to test with an automatic test, or to present tones and watch for responses as part of explaining the test to the subject. Talk-over switching is available in this mode. If you wish to have the audiometer automatically set the dB levels and determine a threshold while in this mode, see Semi-Automatic Manual Mode.

Push Button	Description
Microphone	enables talk-over microphone; click push button again to disable microphone.
Present Stimulus	presents the specified stimulus
Set NR *	records the threshold as No Response
Set Threshold *	records the threshold as the current setting of the knobs
Set NT	cancels test results and returns the setting to Not Tested

*Appears only if Semi-Automatic Manual Mode is not enabled (see Semi-Automatic Manual Mode).

To determine a subject threshold manually:

1. Enter manual mode.
   There are a number of methods of doing this, one of which is to press F9 and select a booth. You may also enter manual mode by choosing Manual from the Test menu in the Control Window.
2. Select the ear to test in the Ear group box.
3. Select the frequency to test using either the left knob control or the left and right arrow keys on your computer keyboard.
4. Choose the initial stimulus intensity using either the right knob control or the up and down arrow keys on your computer keyboard.
5. Choose the Present Stimulus button to present the stimulus.
   The Stimulus indicator flashes to show stimulus presentation. The Response indicator flashes as the subject responds.
   The audiometer will present a pulsed or continuous stimulus depending on the Test Configuration and Information Tab settings.
   If the subject responds, the stimulus level will be lowered by 10dB, otherwise the stimulus level is raised 5dB.

Copyright 2008 SRMi Consulting, LLC

6. Continue presenting the stimulus until a threshold is established.
   The threshold is recorded in the appropriate position near the top of the dialog box. It is highlighted (inverted in color).
   When the subject has provided sufficient responses to determine a threshold, the threshold is recorded in the appropriate position near the top of the dialog box. Threshold determination criteria are the same as in automatic mode and are described in the section Threshold Determination.

- To determine another threshold manually, go to step 2, above.
- Choose Close to quit manual mode.

Copyright 2008 SRMi Consulting, LLC

Daily Calibration Check

Daily Calibration

The OSHA Hearing Conservation Amendment and the MSHA Noise Regulation require that each audiometer be given a daily calibration check. The audiometer software has a number of features that make this daily check as efficient and convenient as possible.

Daily Calibration Configuration

The Daily Calibration Configuration dialog box is the same as the Test Configuration dialog box except that the 'Prohibit Audiogram without Daily Calibration' check box does not appear in the General tab, and the MPANLs tab does not appear. You may use the recommended test configurations for daily calibration, or you may choose your own settings. For information on automatic test features, see the sections beginning with General Tab (Test Configuration).

The factory-defined test configurations that appear in the Daily Calibration Configuration dialog box are as follows:

- Bio-Acoustic Simulator
- Bio-Acoustic Simulator with 8kHz
- Human Ear
- Human Ear with 8kHz

The audiometer detects whether the operator has 'set' daily calibration and, if so, automatically uses the Daily Calibration Configuration for testing.

To choose a configuration for the daily calibration test:

1. In the Control Window, choose Daily Calibration from the Audiometer menu, then Configuration from the submenu.
   The Daily Calibration Configuration List dialog box appears.
2. Select the desired configuration and choose Close.

To change a configuration for the daily calibration test:

1. In the Control Window, choose Daily Calibration from the Audiometer menu, then Configuration from the submenu.
   The Daily Calibration Configuration List dialog box appears.
2. Select the desired test and choose the Modify push button.
   The Daily Calibration Configuration dialog box appears.
3. Choose the desired settings and choose OK.

Copyright 2008 SRMi Consulting, LLC

Daily Calibration Check using the Bio-Acoustic Simulator

Using the Bio-Acoustic Simulator with the audiometer software will help satisfy the requirement for daily biologic calibration checks in compliance with OSHA (or MSHA) guidelines. Perform this procedure at the start of each day's test session.

To perform daily calibration using the Bio-Acoustic Simulator:

1. Set up the simulator(s).
   Configure the system as described in the sections beginning with Daily Calibration Check using the Bio-Acoustic Simulator. Remove the response cord from the simulator jack and place the headphones on the simulator. Extend the headband as necessary so that the ear cushions are centered.
2. In the Control Window, choose 'Set' from the Daily Calibration submenu in the Audiometer menu.
   Choosing 'Set' sets the Daily Calibration indicator in the information tab, and causes the Daily Calibration Configuration to be used for testing.

   The audiometer(s) is (are) now ready for daily calibration.
3. Begin the automatic testing by pressing the Start button.
   As above, if you have more than one booth, choose the booth number or All Enabled Booths as appropriate. The audiometer(s) will begin testing.
4. When the booth status field indicates ‘Finished’, print the test(s); see Save/Print Daily Calibration dialog box, below.
5. To end daily calibration and to reset the booth(s) for testing subjects, choose Clear from the Daily Calibration menu.
   You may alternately clear the Daily Calibration check box on each booth’s Information Tab.
6. To prepare for subject testing, plug the response cord into the Response jack of the simulator.
   If you are using a BAS-200, the power indicator will go out, signaling that the simulator is out of the circuit and will not affect subject testing.
   If you are using a BAS-200slm, the power indicator will stay on, indicating that the sound level meter is still operational. The simulator will not affect subject testing.
   Unplugging the response cord again will prepare the system for biologic check.

   You can prohibit the start of an audiogram without daily calibration. See Prohibit Audiogram without Daily Calibration.

Save/Print Daily Calibration dialog box

At the top of the Save/Print Daily Calibration dialog box are edit boxes for entering the audiometer serial number, model information, and annual calibration date.

Copyright 2008 SRMi Consulting, LLC

Current Page

On the Current page, the Date and Time edit boxes show today's date and the current time by default. These entries can be changed.

If the Reference check box is selected, this audiogram will be marked as a reference audiogram for calibration checks. If a future calibration check is marked as a reference, there is no need to open this audiogram and uncheck this box: the audiometer software automatically uses the latest reference audiogram.

The Functional Check check box will already be checked if a a functional check was performed on the audiometer today. Subsequent functional checks on that day will select the check box in all daily calibration checks performed on that day. This feature allows you to perform the Functional Check either before or after the daily calibration.

The Simulator Serial Number edit box is for the serial number of the simulator.

The Examiner edit box is for the name of the examiner doing the daily calibration check.

The Comment edit box is for any comments the technician wishes to make.

Reference Page

The Reference page shows the daily calibration reference audiogram.

Deviation Page

The Deviation page shows the absolute value of the reference audiogram minus the current audiogram. If no thresholds have shifted by more than 5 dB, the audiometer has passed the calibration check.

The Results box shows whether the audiometer has passed the daily calibration check

Sound Level Meter Group Box

For information on this group box, see Sound Level Meter group box in the Audiograms section.

PUSH BUTTONS

Options

The Options push button selects Daily Calibration Save/Print Options. See Daily Calibration Save/Print Options.

Update Reference

(Do Not Have Plus Package:) The Update Reference push button stores this daily calibration check as the reference audiogram.

Copyright 2008 SRMi Consulting, LLC

Save

(Plus Package Only:) The Save push button stores this daily calibration check in Daily Calibration Storage.
If 'Print on Save' is selected in Daily Calibration Save/Print Options, the daily calibration report will be printed when the Save push button is selected.

Print

The Print push button prints the daily calibration report that is currently selected in the Daily Calibration Save/Print Options dialog box. See Daily Calibration Save/Print Options for more information.

To see the Save/Print Daily Calibration dialog box:

1. From the Audiometer menu in the Control Window, choose Daily Calibration, then Save/Print from the submenu.

Printing a Daily Calibration Report

The daily calibration report that prints is set in the Daily Calibration Options dialog box. Other options include 'Print on Save' and 'Print to Screen'. See Daily Calibration Save/Print Options for more information.

To print a daily calibration audiogram:

1. From the Audiometer menu in the Control Window, choose Daily Calibration, then Save/Print from the submenu.
   The Save/Print Daily Calibration dialog box appears.
2. Choose the Print push button.

Updating the Daily Calibration Reference Test

If you are updating the reference audiogram at the end of the daily calibration test, use the first procedure below. If you wish to enter threshold levels manually and mark the audiogram as a daily calibration reference, use the second procedure.

To update the reference audiogram for daily calibration at the end of the test:

1. From the Daily Calibration submenu in the Audiometer menu in the Control Window, choose Save/Print.
   The Save/Print Daily Calibration dialog box appears.
2. Select the Reference check box.
3. Enter other information as desired.

- (Plus Package Only:) Choose the Save push button. This action stores the audiogram as the reference audiogram in Daily Calibration Storage.

Copyright 2008 SRMi Consulting, LLC

- (Do Not Have Plus Package:) Choose the Update Reference push button, then choose Close.
  The current data is now stored as the new baseline (reference) audiogram.

To manually enter threshold levels for a daily calibration and mark it as the reference:

1. Start the audiometer, then stop it.
2. From the Daily Calibration submenu in the Audiometer menu in the Control Window, choose Save/Print.
3. Enter the daily calibration date in the Cal Date edit box.
4. In the Current tab, enter the reference audiogram data in the threshold edit boxes.
5. Enter other information as desired.

- (Plus Package Only:) Choose the Save push button. This action stores the audiogram as the reference audiogram in Daily Calibration Storage.
- (Do Not Have Plus Package:) Choose the Update Reference push button, then choose Close.
  The current data is now stored as the new baseline (reference) audiogram.

Daily Calibration Save/Print Options

This dialog box shows the available report templates and Select/Sorts for the daily calibration report. Other options can also be set here. The table below summarizes the options.

Options	Description
Report Template File	specifies the template file to be used when printing a daily calibration report. 'Daily Calibration Certificate' is the available report if you do not have the Plus Package.
Report Select/Sort	specifies what data will be included in a report
Print on Save (Plus Package Only)	prints the daily calibration report when the daily calibration audiogram is saved
Print to Screen	selecting this check box causes the data to be printed to the screen; clearing it will cause the

Copyright 2008 SRMi Consulting, LLC

	data to be printed to the printer
Copies	specifies how many copies of the daily calibration report will be printed

The Report Template combo box specifies the daily calibration report template that will be used for printing. For descriptions of the reports, see the sections beginning with Daily Calibration Reports.

(Plus Package Only:) If you have added custom reports of the "Daily Calibration" Type using Report Options, they will appear in the Report Template combo box.

In the Report Select/Sort list box, the available Select/Sorts appear for the Report Template that is currently selected.

'Test Date Range' will select all daily calibrations for audiometers that have a daily calibration in that range.

'Test Date Range Exclusive' will select only daily calibrations in that range.

(Plus Package Only:) If the Print on Save check box is selected, the daily calibration report will print when it is saved.

If the Print to Screen check box is selected, the daily calibration report will be printed to the screen instead of to the printer.

The Copies control allows you to select the number of copies that will be printed of the daily calibration report.

To see the Daily Calibration Save/Print Options dialog box:

1. From the Audiometer menu in the Control Window, choose Daily Calibration, then Save/Print from the submenu.
   The Save/Print Daily Calibration dialog box appears.
2. Choose the Options push button at the bottom of the dialog box.
   The Daily Calibration Save/Print Options dialog box appears.

Copyright 2008 SRMi Consulting, LLC

Functional Check

Audiometer Functional Check

The audiometer software provides a functional check so the operator may verify the correct functioning of the instrument. The operator listens to a sequence of tones that cover both ears, all frequencies, and most of the dynamic range of the audiometer. Simultaneous functional checks may be done on more than one audiometer if additional listeners are available.

In the Functional Check dialog box, the Enable 8000 Hz check box allows you to include 8000 Hz tones in the functional check. The check will include 8000 Hz if this check box is selected. Clearing this check box disables checking 8000 Hz.

You can set the audiometer software to prohibit testing if a functional check has not been performed on that day, using the Test Configuration feature. See Prohibit Audiogram without Functional Check.

To see the Functional Check dialog box:

1. From the Audiometer menu in the Control Window, choose Functional Check.

PLUS PACKAGE ONLY

If a functional check was completed on the same date as a daily calibration check, the Functional Check check box will be selected in the daily calibration audiogram dialog box for that audiogram, even if the functional check was performed after the daily calibration check.

Functional Check Sequence

The functional check presents tones in the selected audiometer booth. Tones are presented with a one-second interval between presentations.

The functional check has the following sequence of tone presentations:

Ear	Frequency (Hz)	Intensity (dB)
Left	500	60
Left	1000	60
Left	2000	60
Left	3000	60
Left	4000	60
Left	6000	60
Left	8000*	60
Right	1000	70
Right	1000	60

Copyright 2008 SRMi Consulting, LLC

Right	1000	50
Right	1000	40
Right	1000	30
Right	1000	20
Right	1000	10
Right	1000	0
	*optional	

At the conclusion of this series, steady 1000 Hz tones at 60 dB will be available in each phone to check for bad headset cables.

Functional Check Procedure

To do a functional check of an audiometer booth:

1. Choose Functional Check from the Control Window Audiometer menu.
   The Functional Check dialog box appears.
2. Using the Enable 8000 Hz check box, choose whether 8000 Hz will be tested.
3. Place the headset on your head and hold the response switch in your hand.
4. Press the response switch button..
   The functional test starts. The current stimulus is shown in the Current Output group box.
   Pressing the hand switch while the tone is presented will repeat the current tone.
   Pressing the Stop or Close push buttons interrupts the functional check.
   The functional check may also be started by pressing the Start push button in the Functional Check dialog box, then choosing the booth in the Select Booth dialog box.
5. Check the headset cable for ‘opens’ or ‘crackle’.
   At the end of the sequence of tones, the left phone emits a steady 1000 Hz tone at 60dB. Wiggle the headset cable both at the jack and headset and listen for breaks or crackle in the sound.
6. Press the hand switch to switch the tone to the right phone.
7. When finished, press the Close push button to end the functional check.

Copyright 2008 SRMi Consulting, LLC

Languages

Languages

The languages available for automatic voice instructions are English, Spanish, Hmong, German, Hindi, Tibetan, Vietnamese, French, Bosnian, Somali, Russian, Cambodian, Italian, Japanese, Polish, and Tagalog. You may set any of these languages as the preferred language of a subject, or add voice instructions in the language(s) of your choice. The list of languages appears in the Languages dialog box. It is not possible to make changes to the factory-defined voice instructions.

The preferred language of a subject is set when you are entering subject demographic data (in the Add Subject or Modify Subject dialog box). The default language is English.

The default language for testing is set in the Test Configuration dialog box. For information on the handling of languages for automatic voice instructions, see Languages for Voice Instructions .

You may add languages using the Language dialog box. Any language that you add will then appear as a language choice for subject demographic data (in the Add Subject or Modify Subject dialog box). If you then choose this language for the subject, the subject will be automatically tested in the language when assigned.

In the Languages dialog box, use the Add, Modify, and Delete push buttons at right to make changes. Use the Item Up and Item Down push buttons to move languages up and down in the list.

The Id number combo box is used to assign an ID number to the language. The number must be in the range from 32 to 63 inclusive, and must be unique. This number is sent to third-party hearing conservation databases instead of the language name.

To see the Languages dialog box:

1. From the File menu in the Control Window, choose Languages.

IF YOU ARE USING STORAGE AS YOUR DATABASE INTERFACE:

These twelve languages are also available as choices for the Notification Letter. The Notification Letter for a given subject will print in the preferred language of the subject.

PLUS PACKAGE ONLY

Any language that you add will appear as a choice in the Notification Letter dialog box. You will then be able to enter texts in this language for the Notification Letter, and have the letter printed in this language.

Copyright 2008 SRMi Consulting, LLC

Adding a Language

To add a language for automatic voice instructions:

1. Using a PC, record the instructions in a wave (.wav) file format.
   Windows includes the Sound Recorder applet. See Sound Recorder in the Index of Windows Help.
2. From the File menu in the Control Window, choose Languages.
   The Language dialog box appears.
3. Choose the Add push button.
   The Add Language dialog box appears.
4. In the Name edit box, enter the name of the language you are adding.
5. In the Id combo box, enter the language identification number.
   The number must be in the range from 32 to 63 inclusive, and must be unique. This number is sent to third-party hearing conservation databases instead of the language name.
6. In the edit boxes, enter the paths of the wave files, or Browse to find the paths.
   The wave files will always be accessed in the location specified in the edit boxes. The files are not copied elsewhere.
7. When finished, choose OK.
8. In the Languages dialog box, choose Close.

Modifying a Language

To modify a language for automatic voice instructions:

1. From the File menu in the Control Window, choose Languages.
   The Languages dialog box appears.
2. Select the language you wish to modify.
3. Choose the Modify push button.
   The Modify Language dialog box appears.
4. Make the desired changes.
5. Choose OK.
6. In the Languages dialog box, choose Close.

Copyright 2008 SRMi Consulting, LLC

Deleting a Language

To delete a language for automatic voice instructions:

1. From the Control Window File menu, choose Languages.
   The Languages dialog box appears.
2. Select the language you wish to delete.
3. Choose the Delete push button.
4. Choose Yes to delete the language.
5. In the Languages dialog box, choose Close.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Testing, Saving, and Printing with STORAGE

Performing an Audiogram

The typical method of performing an audiogram is described in the sections below. It is assumed in these procedures that you are using Storage as your database interface. If you are using a database other than Storage, refer to the Data Transfer sections and your database documentation.

Assigning a Subject

Each audiogram must be associated with a subject in order to save it. The process of associating an audiogram with the person who is being tested is referred to here as assigning.

(If you are using a database other than Storage, refer to the sections beginning with Data Transfer for information on assigning a subject using your database.)

STORAGE

If the database interface you are using is Storage, follow the instructions in this section to assign a subject.

You may enter data in audiogram data fields such as Examiner before, during, or after a test. When you choose the Assign button in the Assign dialog box or the Save button in the Save/Print Test dialog box, all the data you are entering will be associated with the same audiogram. You may thus enter data for the same audiogram several times, as long as the Clear Test command has not been chosen. The Clear Test command will clear the audiometer for a new subject.

If you wish the Assign dialog box to appear automatically when a test starts, select the Automatic Assign on Start check box in the Test Configuration dialog box.

If a subject is assigned before testing time, the language specified as part of that subject's demographic data will be used for automatic voice instructions. Also, if the Notification Letter is chosen and the subject is assigned before printing, the letter will be in the same language.

Assigning a subject is required if you wish to use automatic retest relative to baseline (see Automatic Retests) and real-time STS analysis features (see Information Tab Fields). The subject can be assigned after the test has started.

A subject must be assigned before an audiogram begins in order to use the HSL feature (see Historical Starting Level (HSL)).

PLUS PACKAGE ONLY: The Add History button in the Assign dialog box adds a history for the subject.

Copyright 2008 SRMi Consulting, LLC

To assign a subject:

1. Choose Assign Subject from the Audiometer menu, or choose the Assign Subject toolbar button.
   The Assign dialog box appears.
2. You may enter the subject by Social Security number or, if the subject is already stored, you may look up his or her name (to do so, continue with step 6).

To enter the subject by Subject ID:

3. Enter the subject's Subject ID in the appropriate edit box.
4. If no matching subject is stored, enter any additional desired demographic information in the space provided.
5. Continue with Step 8.

To enter the subject by looking up his or her name:

6. Choose the Last Name button.
   The Select Name dialog box appears.
7. Select the name of the person you wish to enter and press OK.
8. When finished with the Assign Subject dialog box, choose the Assign button.

Verifying Correct Audiometer Setup

To verify correct audiometer setup:

1. From the Control Window, choose Test Configuration from the Audiometer menu.
2. In the Test Configuration List dialog box, make sure the correct test is selected. If not, select the correct test.
3. Choose the Modify push button. .
4. If the automatic test shown is not correct, modify the test.
   See the sections beginning with Test Configuration Dialog Box for information on features.
5. When all information is correct, choose OK.

Beginning Automatic Testing

To begin automatic testing:

1. Seat the subject comfortably and fit the headset for his or her head.
   The ear cushion should be placed directly over the subject's ear canal. The subject should not place or adjust the headset since this may result in incorrect placement of the headset.
2. Start the automatic test by choosing the Start button from the Control Window. If you have more than one booth, select the correct booth.

Copyright 2008 SRMi Consulting, LLC

You may watch the bracketing on the booth information display to confirm that the subject understands the test instructions.

➢ If the database interface you are using is OHM, Medgate, HearTrak (Windows), or Storage, you may select a subject while the test is in progress by choosing the Assign Subject push button.

Saving an Audiogram

If the database interface you are using is Storage, follow the procedure below to save an audiogram.

(If you are using a database other than Storage/Plus Package, refer to the sections beginning with Data Transfer for information on saving an audiogram.)

If the Automatic Save on Test Complete check box is selected in the Test Configuration dialog box, the Save/Print Test dialog box will appear automatically at the end of a test if no subject has been assigned.

If you wish the test to be printed automatically when it is saved, select 'Print on Save' in Save/Print Options (accessed by pressing the Options button in the Save/Print Test dialog box).

The report template and select/sort method are set in the Save/Print Options dialog box. See Save/Print Options.

Manual revision of a baseline will only be possible if Automatic Baseline Revision is not enabled for the selected company.

To save a audiogram:

1. When the test status indicates Finished or Keep Busy, choose Save/Print Test from the Audiometer menu.
   If you are controlling multiple stations, choose the station to save in the Select Audiometer dialog box.
   The Save/Print dialog box appears.
2. Add any data or comments you wish in the Save/Print Test dialog box.

➢ To print a report for the current subject, choose the Print button in the dialog box.

➢ To add a history for the current subject, choose the Add History button in the dialog box (Plus Package only).

➢ If you wish to make this test the new baseline audiogram, replacing the old baseline, see Revising a Baseline Manually, below. Automatic Baseline Revision must be disabled for the current company.

3. Choose the Save button to save the test.
   If you are controlling multiple stations, the Save/Print Test dialog box is displayed for another station. Repeat the steps above until all stations are saved.
4. From the Audiometer menu, choose Clear to clear the audiometer for testing another subject.

Copyright 2008 SRMi Consulting, LLC

Printing an Audiogram

If the database interface you are using is Storage, follow the procedure below to print an audiogram.

If you are using a database other than Storage/Plus Package, refer to the sections beginning with Data Transfer for information on printing an audiogram.

To print a test:

1. From the Audiometer menu, choose Save/Print Test.
   The Save/Print Test dialog box appears.
2. Choose the Print button in the Save/Print Test dialog box.

   The report template and select/sort used for printing are set in the Save/Print Options dialog box, which is described in the section above. This dialog box also contains the 'Print on Save' and 'Print to Screen' options.

Save/Print Options

The report template and select/sort are set in the Save/Print Options dialog box. (To see the Save/Print Options dialog box, choose Save/Print Test from the Audiometer menu, then choose the Options push button).

PLUS PACKAGE ONLY: see the next section. The Multiple Report Print Options dialog box, instead of Save/Print Options, appears when the Options push button is selected.

For information on reports and select/sorts, see the sections beginning with Reports.

You have the option of choosing to "Print on Save" using the Print on Save button.

You can choose to print to the screen by selecting the Print to Screen check box.

The Copies control sets the number of copies of the report that will be printed.

To set the report template and to see other options:

1. From the Audiometer menu in the Control Window, choose Save/Print Test.
2. In the Save/Print Test dialog box, choose the Options push button.
   The Save/Print Options dialog box appears.
3. In the Report Template combo box, choose the report you wish to use.
4. In the Report Select/Sort combo box, choose the select/sort method.
5. Select whether to Print on Save.
6. Select whether to Print to Screen.
7. Choose the number of copies.
8. When finished, choose OK.

Copyright 2008 SRMi Consulting, LLC

The choices made here will dictate which report is used for printing and how it is printed.

Multiple Report Print Options

PLUS PACKAGE ONLY

The options for printing and saving are set in the Multiple Report Print Options dialog box. (To see the Multiple Report Print Options dialog box, choose Save/Print Test from the Audiometer menu, then choose the Options push button). This dialog box shows the reports that will be printed at the end of a test if:

- the Print push button in the Save/Print Test dialog box is chosen

--or--

- automatic printing has been enabled (that is, if Automatic Save on Test Complete (in Test Configuration) and Print on Save (in the Add Multiple Report Print dialog box) are selected)

The options that have been selected for each report appear in columns. The Enabled column shows an X if the report is enabled for printing. (See the next section for more information on enabling a report.)

Use the Add, Modify, and Delete push buttons to add, modify, and delete reports for Multiple Report Print. The maximum number of reports that can appear in the list is 20. The minimum number is 1.

The reports in the list will be printed in the order that they appear in the list. Use the Item Up and Item Down push buttons to make changes to the order of reports.

Add Multiple Report Print dialog box

PLUS PACKAGE ONLY

The Add Multiple Report Print dialog box allows to you add a report to Multiple Report Print. If you add a report, the report will appear in the list in Multiple Report Print Options and can be enabled or disabled for printing, as desired.

If the Enabled check box is selected for a report, this report will be printed at the end of a test if:

- the Print push button in the Save/Print Test dialog box is chosen

--or--

- automatic printing has been enabled (that is, if Automatic Save on Test Complete (in Test Configuration) and Print on Save (in the Add Multiple Report Print dialog box) are selected)

If the Enabled check box is not selected, this report will not be printed at the end of a test, but it will remain in the list. For example, some companies may not need this particular report, but other companies do wish to have it. Therefore, the report can be kept in Multiple Report Print, but disabled or enabled depending on which company you are testing.

Copyright 2008 SRMi Consulting, LLC

You have the option of choosing to "Print on Save" using the Print on Save button.

You can choose to print to the screen by selecting the Print to Screen check box.

The Copies control sets the number of copies of the report that will be printed.

To see the Add Multiple Report Print dialog box:

1. From the Audiometer menu in the Control Window, choose Save/Print Test.
   The Save/Print Test dialog box appears.
2. Choose the Options push button.
   The Multiple Report Print Options dialog box appears.
3. Choose the Add push button.

Adding a Report for Multiple Report Print

PLUS PACKAGE ONLY

To add a report to Multiple Report Print:

1. From the Audiometer menu, choose Save/Print Test.
   The Save/Print Test dialog box appears.
2. Choose the Options push button.
   The Multiple Report Print Options dialog box appears.
3. Choose the Add push button.
   The Add Multiple Report Print dialog box appears.
4. In the Report Template combo box, choose the report.
5. In the Report Select/Sort combo box, choose the Select/Sort.
6. Choose whether to enable this report using the Enabled check box.
   For a discussion of this feature, see Add Multiple Report Print dialog box, above.
7. Choose whether to "Print on Save" using the Print on Save check box.
8. Choose whether to print to the screen using the Print to Screen check box.
9. Choose the number of copies using the Copies control.
10. When finished, choose OK.
11. In the Multiple Report Print Options dialog box, choose Close.

Modifying a Report for Multiple Report Print

PLUS PACKAGE ONLY

To modify a report for Multiple Report Print:

1. From the Audiometer menu, choose Save/Print Test.
   The Save/Print Test dialog box appears.

Copyright 2008 SRMi Consulting, LLC

2. Choose the Options push button.
   The Multiple Report Print Options dialog box appears.
3. Select the report youwish to modify in the list.
4. Choose the Modify push button.
   The Modify Multiple Report Print dialog box appears.
5. Make changes as desired.
6. When finished, choose OK.
7. In the Multiple Report Print Options dialog box, choose Close.

Deleting a Report for Multiple Report Print

PLUS PACKAGE ONLY

To delete a report in Multiple Report Print:

1. From the Audiometer menu, choose Save/Print Test.
   The Save/Print Test dialog box appears.
2. Choose the Options push button.
   The Multiple Report Print Options dialog box appears.
3. Select the report youwish to delete in the list.
4. Choose the Delete push button.
   The Delete Multiple Report Print dialog box appears.
5. Choose Yes to delete the report from Multiple Report Print.
6. In the Multiple Report Print Options dialog box, choose Close.

Revising a Baseline Manually

If the database interface you are using is Storage, follow the procedures below if you wish to update the baseline audiogram or mark a saved audiogram as the new baseline. Note that manual revision of a baseline will be possible only if Automatic Baseline Revision is not enabled for the current company (Plus Package only). See Automatic Baseline Revision for more information.

If you have the Plus Package and have chosen MSHA as the Regulation for the current company, the baseline check boxes will be called MSHA STS Baseline and MSHA Reportable Shift Baseline.

If you are using a database other than Storage/Plus Package, refer to your database documentation for information on how to revise a baseline.

Copyright 2008 SRMi Consulting, LLC

To update the baseline audiogram while saving a test:

1. Choose Save/Print Test from the Audiometer menu.
   The Save/Print Test dialog box appears.
2. Enter the subject in the Save/Print Test dialog box.
3. In the Current tab, select the OSHA STS Baseline and the OSHA Recordable Shift Baseline check box(es) as appropriate.
   If you have enabled Automatic Baseline Revision for this company, you will not be able to make changes to these check boxes (they will be gray). See Automatic Baseline Revision for more information (Plus Package only).
4. Choose the Save button.
5. In the Save/Print Test dialog box, press the Save button.
   This audiogram is now the new baseline audiogram. There is no need to go back to previous baseline audiograms and deselect the check boxes for STS Baseline or Recordable/Reportable Shift Baseline.

To mark a saved audiogram as the new baseline:

1. In Storage View, select the subject in the Subject List.
2. Select the audiogram in the Audiogram List that you wish to mark as the new baseline.
3. Double-click the audiogram, or from the Test menu, choose Modify, then Audiogram.
   The Modify Audiogram dialog box appears.
4. Select the OSHA STS Baseline and/or OSHA Recordable Shift Baseline check box(es) as appropriate.
   If you have enabled Automatic Baseline Revision for this company, you will not be able to make changes to these check boxes (they will be gray). See Automatic Baseline Revision for more information (Plus Package only).
5. Choose OK.
   This audiogram is now the new baseline audiogram. There is no need to go back to previous baseline audiograms and deselect the check boxes for STS Baseline or Recordable/Reportable Shift Baseline.

Copyright 2008 SRMi Consulting, LLC

STORAGE/PLUS PACKAGE

Storage/Plus Package

This section is only relevant to you if you have chosen Storage as your database interface in the Setup Audiometer dialog box (see Audiometer Setup).

Storage/Plus Package Features

If you do not have the Plus Package, Storage provides you with six reports and room for unlimited subjects and audiograms in one company.

If you have the Plus Package, you have nineteen reports available, as well as room for unlimited subjects and audiograms in multiple companies. The Plus Package is an integrated extension of the audiometer software that provides you with a powerful database system for managing your hearing conservation program. If you are using the Plus Package, "Storage" is the Database Interface that you will choose in the Setup dialog box (see Audiometer Setup).

To determine whether you have the Plus Package:

1. Choose 'About' from the Help menu in the Control Window.
   If the Plus Package is installed, 'Plus Package Installed' will appear in the About dialog box.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Database View

Split Screen

If and only if the Database Interface in the Setup dialog box is set to Storage (see Audiometer Setup), the Control Window will normally appear as a split screen with two panes. The left pane shows Database View, while the right pane shows Audiometer View.

To adjust the width of the panes:

1. Position the mouse on the boundary line between the two panes.
   The mouse cursor will change to a resizing cursor.
2. Drag the boundary line to the desired place.
   The panes will be resized accordingly.
3. Move the mouse away from the boundary line.
   The mouse cursor will revert to the select cursor.

To move downward or upward in the left pane:

1. Drag the vertical scroll bar downward or upward.

To move right or left in the left pane:

1. Drag the horizontal scroll bar to the right or left.

One of the panes may be at zero width, and not be apparent. The directions below are for restoring the left pane, but the same concepts apply to restoring the right pane.

To make the left pane appear:

1. Position the mouse on the vertical line at the left of the Control Window.
   The mouse cursor will change to a resizing cursor.
2. Drag the line to the right.
   The left pane will appear.
3. Position the line for the desired pane width.
4. Move the mouse away from the boundary line.
   The mouse cursor will revert to the select cursor.

Database View

If the Database Interface in Audiometer Setup is set to Storage, the Control Window is shown as a split screen, with Database View in the left pane. Database View shows the company and subject data in Subject View, audiograms in the Audiograms Tab, and Histories in the Histories Tab (Plus Package only).

Copyright 2008 SRMi Consulting, LLC

Subject View

If the Database Interface in Audiometer Setup is set to Storage, Subject View appears in the left pane. Here subjects in the company that is currently selected are listed alphabetically with their Social Security numbers and other demographic information.

Subject Context Menu

An alternate method of working with subject data is with the Subject Context Menu. This menu appears when the mouse pointer is over a subject in Subject View (in Database View), and the mouse's right button is clicked.

You may choose any of the menu item functions. See Menu Functions. The function is applied to the subject over which the mouse was positioned when the click occurred.

Audiograms Page

The Audiograms Page is at the bottom of Database View in the Control Window. When the Audiograms tab is selected, audiograms are displayed for the subject that is currently selected in Subject View, and you can add an audiogram by selecting the 'Add Test' toolbar button.

Baseline audiograms are marked with an 'X' in one or more of the baseline columns. The current baseline audiogram is the one that was performed most recently.

To see audiograms for a subject:

1. Select the subject in Subject View.
2. Click on the Audiograms tab.
   The audiograms for that subject appear.

Audiogram Context Menu

An alternate method of working with audiogram data is with the Audiogram Context Menu. This menu appears when the mouse pointer is over an audiogram in Audiogram View, and the mouse's right button is clicked.

You may choose any of the menu item functions. See Menu Functions. The function is applied to the audiogram over which the mouse was positioned when the click occurred.

Copyright 2008 SRMi Consulting, LLC

Histories Tab

PLUS PACKAGE ONLY

The Histories page is at the bottom of Database View in the Control Window. If the Histories tab is selected, medical histories are displayed for the subject that is currently selected in Subject View, and the 'Add History' toolbar button is displayed.

History Context Menu

PLUS PACKAGE ONLY

An alternate method of working with subject history data is with the History Context Menu. This menu appears when the mouse pointer is over a history in History View (in Database View), and the mouse's right button is clicked.

You may choose any of the menu item functions. See Menu Functions. The function is applied to the history over which the mouse was positioned when the click occurred.

Viewing Audiograms (and Histories with Plus Package)

IF YOU DO NOT HAVE THE PLUS PACKAGE:

To see the audiograms for a subject:

1. In Subject View, select the subject whose audiograms you wish to see.
   In Audiogram View below, the audiograms for that subject will appear.

IF YOU HAVE THE PLUS PACKAGE:

To see the audiograms or histories for a subject:

1. In Subject View, select the subject whose audiograms or histories you wish to see.
2. Choose the Audiogram or Histories tab.
   The audiograms or histories will appear for that subject.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Companies

Companies

If you do not have the Plus Package:

One company is available for you in Storage. All audiograms that are saved will be assigned to this company. The subjects of the company are shown in Subject View.

To see the Company dialog box:

1. From the File menu in the Control Window, choose Company.

If you have the Plus Package:

You have the capability of entering multiple companies. Companies are listed in alphabetical order in the Company dialog box. At the right are push buttons enabling you to add, modify, duplicate, or delete companies.

All audiograms that are saved will be assigned to the company that is selected in the Company dialog box. The subjects of this company are shown in the Subject View.

The same subject can be entered in different companies. If you wish to enter an existing subject in a second company, the subject's record and tests in the first company will not be affected.

You may wish to move a subject to a different company. If a subject with the same Social Security number exists in the destination company, the corresponding demographic fields will be overwritten by the fields from the transferred record. The audiograms and histories of the two subjects will be merged. If two audiograms or histories with the same date and time exist, the transferred audiogram or history will overwrite the records in the destination company.

For a new company you may wish to have the same settings as for the old ones, for example, Notification Letter settings and paragraphs. You can easily duplicate existing company settings by duplicating a company. Refer to the table below for information on which settings are duplicated when you duplicate a company.

Aspects of a Company That Are Duplicated
Name, Address, Phone, Contact Name, Comment
Company settings: e.g., Calculate STS using Age Correction, Retest Period, etc.
User-defined field settings and look-up lists for subjects, audiograms, and histories
Notification Letter settings and paragraphs

Copyright 2008 SRMi Consulting, LLC

To see the Company dialog box:

1. From the File menu in the Control Window, choose Company.

Viewing Companies

PLUS PACKAGE ONLY

To see all companies and select a company:

1. From the File menu in the Control Window, choose Company.
   The Company dialog box appears.
2. Select a company in the list.
   All audiograms that are saved will be assigned to this company.
3. Choose Close.

Company Settings

The following sections describe settings in the Company dialog box (if you have the Plus Package, the settings are in the Add Company and Modify Company dialog boxes). Changing any of these settings for a company will cause the database to reanalyze audiograms.

Calculate STS Using Age Correction check box

If this check box is checked, the database will calculate STS using Age Correction for a company.

If you have checked this box for a company, Age Correction will be used when determining persistence.

Changing this setting will cause the database to reanalyze audiograms.

Automatic Baseline Revision

PLUS PACKAGE ONLY

If this check box is checked, the database will analyze audiograms and automatically revise baseline audiograms for this company using the criteria established by the National Hearing Conservation Association (NHCA) in 2000. OSHA and MSHA allow the baseline audiogram to be revised in cases of persistent STS or significant improvement. With Automatic Baseline Revision, there is no need to review the current audiogram in order to determine whether it may constitute a new baseline: the database automatically updates the baseline if the subject's data are found to meet the NHCA criteria for baseline revision. This feature does not eliminate the need for professional management of your hearing conservation program as required by OSHA or MSHA.

Changing this setting will cause the database to reanalyze audiograms.

Copyright 2008 SRMi Consulting, LLC

If Automatic Baseline Revision is not enabled for a company, Audiogram Analysis columns will not show indications having to do with retests, persistence, or improvement.

If Automatic Baseline Revision is checked for a company, the user will not be able to make changes to the OSHA STS Baseline (MSHA STS Baseline) or the OSHA Recordable Shift Baseline (MSHA Reportable Shift Baseline) check boxes in the Add Audiogram or Modify Audiogram dialog box.

The Company Baseline Revision List report will be available if Automatic Baseline Revision has been enabled for a company. If Automatic Baseline Revision is not enabled, this report cannot be printed.

Separate Left/Right Baselines

If the 'Separate Left/Right Baselines' check box is checked, the database will establish separate baseline audiograms for the left and right ears for this company. When the subject is retested in the future, the software analyzes the data for the left and right ears separately and independently. If one ear meets the criteria for revision of baseline, then the database updates the baseline for that ear only. With Separate Left/Right Baselines, if the ears show different hearing trends, the test date of the left ear baseline may be different from the test date of the right ear baseline.

Changing this setting will cause the database to reanalyze audiograms.

Retest Period

Using the Retest Period box, you may choose how long the retest period for subjects in a company should be. You may set the period for anywhere from 0 to 180 days. OSHA and MSHA specify a retest period of 30 days.

Changing this setting will cause the database to reanalyze audiograms.

NR Substitution (dB)

PLUS PACKAGE ONLY

The NR Substitution (dB) check box allows you to substitute a numerical value for any NR (No Response) indication in an audiogram. Substituting a number for NR may enable the software to analyze audiograms without an indication of 'Missing or Invalid Data.' You may choose any number in the combo box. You may also choose not to substitute any number for an NR indication: in this case, choose 'None' in the combo box.

Changing this setting will cause the database to reanalyze audiograms.

Copyright 2008 SRMi Consulting, LLC

Regulation

PLUS PACKAGE ONLY

The Regulation combo box has two choices: OSHA (Occupational Safety and Health Administration) and MSHA (Mine Safety and Health Administration). The OSHA regulation used is 29 CFR 1910.95; the MSHA regulation used is 30 CFR Part 62.

Calculations of STS, Recordable Shift, and other findings will be performed according to OSHA regulations if you have chosen OSHA for a company. Calculations of STS, Reportable Shift, and other findings will be performed according to MSHA regulations if you have chosen MSHA for a company.

Changing this setting will cause the database to reanalyze audiograms.

Subject ID Format

PLUS PACKAGE ONLY

The Subject ID Format push button in the Add Company or Modify Company dialog box enables you to change the format of the Subject ID for all subjects in a company. You can specify legal characters for the Subject ID and set a maximum size and a minimum size.

When the Subject ID Format push button is selected, the Modify Subject ID Format dialog box appears, which is described below.

The Prompt edit box allows you to change the prompt (name or label) of the Subject ID. Changing this setting will change the prompt of the subject ID in dialog boxes, reports, and also in Subject View onscreen (in the column to the left of the Name column). If you are changing the Subject ID format from Social Security numbers, it is recommended that you change the Prompt to something other than ‘SSN’, to avoid confusion.

The Maximum Size edit box and the Minimum size edit box set the maximum and minimum numbers of characters, respectively, for the Subject ID. Acceptable entries are any number from 1 to 20, inclusive. Also, the Minimum cannot be greater than the Maximum. Please note that if you change the maximum size of the Subject ID to a size smaller than that of your current Subject ID, the Subject ID’s of all your subjects will be too long and will be illegal according to your new format, and data may be lost as a result.

The Legal Characters group box shows the available settings for legal characters:

- Social Security number
- Any ASCII Character
- Alphabetic Character Only
- Digit Only

Copyright 2008 SRMi Consulting, LLC

- Alphanumeric Only

  If the 'Social Security number' radio button is selected, the ID for a subject must consist of 9 digits. The Prompt and Maximum Size/Minimum Size edit boxes at left will be filled in automatically and cannot be changed. For this format, the Prompt is 'SSN', the Maximum Size is 9, the Minimum Size is 9, and in the Legal Characters group box, 'Digit Only' is selected. If this format is chosen, auto-formatting will insert hyphens between the third and fourth digits and between the fifth and sixth digits, as follows: XXX-XX-XXXX, so that the ID will look like a traditional Social Security number.

  If you have been using 'Social Security number' as the Subject ID format, and you change the Subject ID format, hyphens will no longer appear in the Subject IDs.

  If 'Any ASCII Character' is chosen, all Subject IDs will be able to contain any character in the ASCII character set, which includes letters, numbers, and other characters such as '%', '$', and '~'.

  If 'Alphabetic Character Only' is chosen, all Subject IDs will have to contain letters only. You will not be able to enter any numbers in the Subject ID, or save any subject with an ID that contains numbers.

  If 'Digit Only' is chosen, all Subject IDs will have to contain numbers only. You will not be able to enter any letters in the Subject ID, or save any subject with an ID that contains letters.

  If 'Alphanumeric Only' is chosen, all Subject IDs may contain letters or numbers or a combination thereof, but not any other ASCII characters such as a tilde (~).

  Please note that if you change the Subject ID format so that some or all of the characters of the current Subject ID's are illegal, data may be lost.

  If you try to save a subject (by choosing OK in the Add Subject or Modify Subject dialog box) with a Subject ID that does not fulfill the requirements of your selected format, you will see an error message saying that the subject identification number (or Social Security number) is illegal. You will have to enter a correct Subject ID according to your format in order to save your subject.

Changing the Subject ID Format

PLUS PACKAGE ONLY

To change the Subject ID format for a company:

1. From the File menu in the Control Window, choose Company.
   The Company dialog box appears.
2. Select the company for which you wish to change the Subject ID format.
3. Choose the Modify push button.
   The Modify Company dialog box appears.

Copyright 2008 SRMi Consulting, LLC

4. In the Legal Characters group box, select the radio button of the desired legal characters.
   If you choose Social Security Number, you will not be able to change the Prompt, Maximum Size, or Minimum Size. Skip to Step 8.
5. In the Prompt edit box, enter the prompt (name or label) for the Subject ID.
   Note that if the Social Security Number radio button is selected in the Legal Characters group box, you will not be able to make changes to the Prompt, Maximum Size, or Minimum Size edit boxes. If you wish to make changes to these edit boxes, you will have to select something other than Social Security Number.
6. In the Maximum Size edit box, choose the maximum number of characters that will be legal.
   Entering a size that is smaller than that of the current Subject ID may lead to loss of data.
7. In the Minimum Size edit box, choose the minimum number of characters that will be legal.
8. Choose OK.
9. In the Modify Company dialog box, choose OK.
10. In the Company dialog box, choose Close.

Adding a Company

If you do not have the Plus Package:

To add a company:

1. From the File menu in the Control Window, choose Company.
   The Company dialog box appears.
2. Enter the company's name and address in the appropriate edit boxes.
3. Enter other information and settings as desired.
4. When finished, choose OK.

If you have the Plus Package:

To add a company:

1. Choose the Add push button at the right of the Company dialog box.
   The Add Company dialog box appears.
2. Enter the company's name and address in the appropriate edit boxes.
3. Enter other information and settings as desired.
4. When finished, choose OK.

Copyright 2008 SRMi Consulting, LLC

Modifying a Company

If you do not have the Plus Package:

To modify a company:

1. From the File menu in the Control Window, choose Company.
   The Company dialog box appears.
2. Choose the Modify push button.
   The Company dialog box appears.
3. Make changes as desired.
4. When finished, choose OK.

If you have the Plus Package:

To modify a company:

1. From the File menu in the Control Window, choose Company.
   The Company dialog box appears.
2. Choose the Modify push button.
   The Modify Company dialog box appears.
3. Make changes as desired.
4. When finished, choose OK.

Deleting a Company

PLUS PACKAGE ONLY

To delete a company:

1. From the File menu in the Control Window, choose Company.
2. Choose the Delete push button at the right of the Company dialog box.
   The Delete Company dialog box appears.
3. Choose Yes to delete the company and all subjects and audiograms within it.

To delete all companies:

1. Choose the Delete All push button at the right of the Company dialog box.
   The Delete All Companies dialog box appears.
2. Choose Yes to delete all companies and all subjects and audiograms.

Copyright 2008 SRMi Consulting, LLC

Duplicating a Company

PLUS PACKAGE ONLY

To duplicate a company:

1. From the File menu in the Control Window, choose Company.
   The Company dialog box appears.
2. Select the company you wish to duplicate.
3. Choose the Duplicate push button.
   A copy of this company will appear in the list.
4. Choose OK.

Copyright 2008 SRMi Consulting, LLC

Subjects

Subjects

IF YOU DO NOT HAVE THE PLUS PACKAGE:

The following sections describe how to view subjects and their audiograms, how to find subjects, and how to add, modify, and delete subjects. You will also find instructions on how to combine records of two subjects in the same company.

For instructions on how to use the look-up push buttons such as Job and Department, see Look-up Boxes .

To see the Add Subject dialog box:

1. From the Edit menu in the Control Window, choose Subject, then Add.

IF YOU HAVE THE PLUS PACKAGE:

The following sections describe how to view subjects and their audiograms and histories, and how to add, modify, and delete subjects. For instructions on how to use the look-up push buttons such as Job and Department, see Look-up Boxes. You will also find instructions on how to move a subject to a different company, how to combine records of two subjects in different companies, and how to combine records of two subjects in the same company.

To see the Add Subject dialog box:

1. From the Edit menu in the Control Window, choose Subject, then Add.

Add Subject Dialog Box

The Add Subject dialog box enables you to add a subject and accompanying demographic data.

The Company box shows the company name. If you have the Plus Package, see the bottom of this page for information on changing the company.

‘SSN" stands for Social Security number.

The language selected in the Language combo box overrides the language of the Test Configuration when this subject is tested, as long as he or she has been assigned.

Select the In Hearing Conservation Program check box if the subject is currently in a hearing conservation program.

The Address push button is for entering the subject’s address.

The Comment push button is for entering any comments.

The unmarked push buttons are for user-defined fields. See User-Defined Data Fields for more information.

Copyright 2008 SRMi Consulting, LLC

PLUS PACKAGE ONLY

If the subject is not in the company that is currently selected, choose the Company push button. The Company dialog box will appear, and the subject's correct company can be chosen.

The edit box under the Company name is for the Subject ID. Settings for the Subject ID, including legal characters and the prompt for this edit box, can be changed in the Modify Subject ID Format dialog box. For more information, see the sections beginning with Subject ID Format.

To see the Add Subject dialog box:

1. From the Edit menu in the Control Window, choose Subject, then Add.

Find Subject Dialog Box

If you wish to search for a subject in the current company or all companies (Plus Package only), choose Find, then Subject, from the Edit menu. The Find Subject dialog box will appear. You can search either by Subject ID or last name.

- Enter the subject's Social Security number in the Soc. Sec. No. edit box (Plus Package only: enter the Subject ID in the Subject ID edit box)

  and/or

- Enter the last name, or the first few letters of the last name, in the Last Name edit box (you can also enter the first name and middle initial in the corresponding edit boxes)

If the 'Select All Companies' check box is selected, all companies will be included in the search instead of just the current company (Plus Package only).

If you enter only a few letters of the person's last name, the search results will show all subjects whose last names begin with those letters.

If there were multiple matches found, you can then select the desired subject in the Find Subject Results dialog box.

PLUS PACKAGE ONLY

If the 'Format Subject ID as SSN' check box is selected, automatic formatting will insert two hyphens into the Subject ID when the ID is entered in the Subject ID edit box, so that the ID looks like a traditional Social Security number. You may want to use this feature if you are searching by SSN so that it is easier to check that you have entered the correct number.

If all companies were included in the search, and the matching subject is in a different company, Storage View will switch to the company of the matching subject.

Copyright 2008 SRMi Consulting, LLC

Viewing Subjects

IF YOU DO NOT HAVE THE PLUS PACKAGE:

To move quickly within the subject list:

1. Make sure the focus is on Subject View.
2. Type the first letter of the last name of the subject whom you wish to find.
   The list will automatically move to the first subject whose last name begins with that letter.

To see the audiograms or histories for a subject:

1. In Subject View, select the subject whose audiograms you wish to see.
   The audiograms for that subject will appear on the Audiograms Page.

IF YOU HAVE THE PLUS PACKAGE:

To see all the subjects and audiograms/histories for a company:

1. From the File menu in the Control Window, choose Company.
   The Company dialog box appears.
2. Select the company whose subjects and audiograms/histories you wish to see.
3. Choose Close.
   The subjects and audiograms/histories appear. The Audiograms and Histories pages show audiograms and histories for the subject that is currently selected in Subject View.

To move quickly within the subject list:

1. Make sure the focus is on Subject View.
2. Type the first letter of the last name of the subject whom you wish to find.
   The list will automatically move to the first subject whose last name begins with that letter.

To see the audiograms or histories for a subject:

1. In Subject View, select the subject whose audiograms or histories you wish to see.
2. Choose the Audiogram or Histories tab.
   The audiograms or histories will appear for that subject.

Adding a Subject

To add a subject:

1. From the Edit menu in the Control Window, choose Add, then Subject.
   The Add Subject dialog box appears.

Copyright 2008 SRMi Consulting, LLC

2. Enter the subject's name and information in the appropriate edit boxes.
3. In the Language combo box, choose the language in which this subject should be tested.
4. Enter any comments in the Comment edit box.
5. When finished, choose OK.

Modifying a Subject

To change information about a subject:

1. From the Edit menu in the Control Window, choose Modify, then Subject.
   The Modify Subject dialog box appears.
2. Make changes as desired.
3. When finished, choose OK.

PLUS PACKAGE ONLY

For information on how to move a subject to a different company, see Moving a Subject to a Different Company.

Deleting a Subject

To delete a subject:

1. In the Subject View in the Control Window, select the person's name in the Subject list box.
2. From the Edit menu in the Control Window, choose Delete, then Subject.
   The Delete Subject dialog box appears.
3. Choose Yes to delete the subject.

To delete all subjects and tests for the current company:

1. From the Edit menu in the Control Window, choose Delete All, then Subject.
   The Delete All Subjects dialog box appears.
2. Choose Yes.
   The Delete All dialog box appears.
3. Type DELETE ALL in the edit box.
4. Choose OK to delete all subjects and their audiograms and histories for the current company.

Copyright 2008 SRMi Consulting, LLC

Finding a Subject

To find a subject:

1. From the Edit menu in the Control Window, choose Find, then Subject.
   The Find Subject dialog box appears.
2. Enter the subject's Social Security number or last name.
   If searching by name, you may also enter the person's first name and middle initial.
3. Choose whether to include all companies in the search using the Search All Companies check box (Plus Package only).
4. Choose OK.
   The Find Subject Results dialog box appears.

- If there is only one match, choose OK.

-OR-

- If there is more than one match, select the correct subject in the list and choose OK.
  The subject's name will be selected in Subject View.
  If all companies were included in the search, and this subject is in a different company, Storage View will switch to the company of the matching subject (Plus Package only).

Moving a Subject to a Different Company

PLUS PACKAGE ONLY

These instructions are for situations in which you wish to move a subject to a different company, and no existing subjects in that company have the same Subject ID. See the next section for situations in which someone in the destination company has the same Subject ID as the person you are trying to move.

To move a subject to a different company:

1. In Subject View in the Control Window, select the subject.
2. Choose Modify from the Subject menu.
   The Modify Subject dialog box appears.
3. In the Modify Subject dialog box, choose the Company push button.
4. In the Company dialog box, select the company you wish to move the subject to.
5. Choose OK.
6. In the Modify Subject dialog box, choose OK.

Copyright 2008 SRMi Consulting, LLC

Combining Two Subjects in Different Companies

PLUS PACKAGE ONLY

These instructions are for situations in which you wish to move a subject to a different company, but a subject with the same Subject ID exists in the destination company. (If no one in the destination company has that Subject ID, refer to the instructions in the section above.) You have two options concerning the demographic fields. For the purposes of explanation, the subject who is being moved is called the "currently displayed subject," and the subject in the destination company is called the "existing subject." Either the demographic data of the existing subject will be overwritten by the demographic data of the currently displayed subject, or the demographic data of the existing subject will be kept. (Either way, the currently displayed subject and associated data will no longer be in the original company.) The audiograms and histories of the two subjects will be merged. See the procedures below for the two different situations.

If two audiograms or histories with the same date and time exist, the transferred audiogram or history will overwrite the corresponding record in the destination company.

To move a subject to a different company and overwrite the demographic data of a subject with the same Subject ID in the destination company:

1. In Subject View in the Control Window, select the subject.
2. Choose Modify from the Subject menu.
   The Modify Subject dialog box appears.
3. In the Modify Subject dialog box, choose the Company push button.
4. In the Company dialog box, select the company you wish to move the subject to.
5. Choose OK.
   A dialog box appears, asking whether you wish to merge the test records of the currently displayed subject with the existing subject.
6. Choose Yes.
   A dialog box appears, asking whether you wish to overwrite the existing subject data with the currently displayed subject data.
7. Choose Yes.
   The demographic data, audiograms, and histories of the currently displayed subject will overwrite the demographic data, audiograms, and histories of the existing subject.
8. In the Modify Subject dialog box, choose OK.

Copyright 2008 SRMi Consulting, LLC

To move a subject to a different company and keep the demographic data of a subject with the same Subject ID in the destination company:

1. In Subject View in the Control Window, select the subject.
2. Choose Modify from the Subject menu.
   The Modify Subject dialog box appears.
3. In the Modify Subject dialog box, choose the Company push button.
4. In the Company dialog box, select the company you wish to move the subject to.
5. Choose OK.
   A dialog box appears, asking whether you wish to merge the test records of the currently displayed subject with the existing subject.
6. Choose Yes.
   A dialog box appears, asking whether you wish to overwrite the existing subject data with the currently displayed subject data.
7. Choose No.
   The audiograms and histories of the currently displayed subject will now be associated with the existing subject, but the demographic data associated with the currently displayed subject have been discarded.
8. In the Modify Subject dialog box, choose OK.

Combining Two Subjects in the Same Company

To combine the records of two subjects in the same company, you will modify the Subject ID of one of the subjects (the "currently displayed subject") to match the Subject ID of the other one (the "existing subject"). You have two options concerning the demographic fields. Either the demographic fields of the existing subject will be overwritten by the demographic fields of the currently displayed subject, or the demographic fields of the existing subject will be kept. The audiograms (and histories, with the Plus Package) of the two subjects will be merged. See the procedures below for the two different situations.

If two audiograms or histories with the same date and time exist, the transferred audiogram or history will overwrite the corresponding audiogram or history associated with the existing subject.

To merge the records of a subject with those of another subject in the same company, and overwrite the demographic data of the destination subject:

1. In Subject View in the Control Window, select the subject whose Subject ID you will be modifying.

Copyright 2008 SRMi Consulting, LLC

2. Choose Modify from the Subject menu.
   The Modify Subject dialog box appears.
3. In the Modify Subject dialog box, change the Subject ID to match that of the other subject.
4. Choose OK.
   A dialog box appears, asking whether you wish to merge the test records of the currently displayed subject with the existing subject.
5. Choose Yes.
   A dialog box appears, asking whether you wish to overwrite the existing subject data with the currently displayed subject data.
6. Choose Yes.
   The demographic data, audiograms, and histories of the currently displayed subject will overwrite the demographic data, audiograms, and histories of the existing subject.
7. In the Modify Subject dialog box, choose OK.

To merge the records of a subject with those of another subject in the same company, and keep the demographic data of the destination subject:

1. In Subject View in the Control Window, select the subject whose Subject ID you will be modifying.
2. Choose Modify from the Subject menu.
   The Modify Subject dialog box appears.
3. In the Modify Subject dialog box, change the Subject ID to match that of the other subject.
4. Choose OK.
   A dialog box appears, asking whether you wish to merge the test records of the currently displayed subject with the existing subject.
5. Choose Yes.
   A dialog box appears, asking whether you wish to overwrite the existing subject data with the currently displayed subject data.
6. Choose No.
   The audiograms and histories of the currently displayed subject will now be associated with the existing subject, but the demographic data associated with the currently displayed subject have been discarded.
7. In the Modify Subject dialog box, choose OK.

Copyright 2008 SRMi Consulting, LLC

Audiograms and Histories

Audiograms

Some audiogram data selections are affected by company settings; see Companies. If you have selected Separate Left/Right Baselines, baseline check boxes will be visible in these dialog boxes for both ears.

The following sections discuss audiogram data fields, database STS Calculation, and procedures for adding, modifying, and deleting audiograms. For information on the audiogram analysis columns in Audiogram View, see Audiogram Analysis Columns .

To see the Add Audiogram dialog box:

1. From the Edit menu in the Control Window, choose Add, then Audiogram.

PLUS PACKAGE ONLY

If you have not selected Automatic Baseline Revision for a company, the OSHA (or MSHA) STS Baseline and OSHA Recordable (or MSHA Reportable) Shift Baseline check boxes can be checked in the Add Audiogram/Modify Audiogram dialog box. On the other hand, if you have selected Automatic Baseline Revision for a company, you cannot change these baseline check boxes.

Refer Subject data field

Refer Subject is a data field in the Add Audiogram and Modify Audiogram dialog boxes. If the Refer Subject edit box contains the response 'Yes', and if this is the most recent audiogram, there will automatically be a medical referral on reports that indicate medical referral. If this audiogram is not the most recent audiogram, a response of Yes for this question will have no bearing on a possible medical referral.

For more information, see Medical Referral.

Reject Audiogram check box

If the Reject Audiogram check box in the Add Audiogram/Modify Audiogram dialog box is checked, this audiogram will not be taken into account by the database in STS calculation or other calculations. (If the database is calculating baseline revision, which is available with the Plus Package only, an audiogram will not be used if this check box is selected.) This check box gives the user the discretion to override the criteria used by the database in STS and other calculations. (For such calculations, the database uses criteria determined by the National Hearing Conservation Association in 2000.) The National Hearing Conservation Association advises that only a professional reviewer (audiologist or physician) may override the NHCA criteria.

Copyright 2008 SRMi Consulting, LLC

The message ‘Rejected test data’ in the Audiogram Analysis columns indicates that the audiogram has been rejected by means of the Reject Audiogram check box.

Sound Level Meter group box

In the Sound Level Meter group box in the Add Audiogram/Modify Audiogram dialog box, values may be entered for sound level meter readings in the ‘Levels’ edit boxes if the readings are between the values of 21.0 and 62.0, inclusive. If the readings you wish to enter are lower or higher than this range, use ‘<21.0’ or ’>62.0’. This manual entry of readings would be done if you have readings from a third-party sound level meter that you wish to save with this audiogram.

If a Benson Medical Instruments Sound Level Meter was installed at the time this audiogram was performed, the Levels edit boxes will show the set of last sound level readings taken.

The MPANL (Maximum Permissible Ambient Noise Level) values of the test configuration for this audiogram appear below the Levels edit boxes if a Sound Level Meter was installed and the Retest on Noise Above MPANL check box was selected in the test configuration for this audiogram.

An indication of ‘In Range’ will appear for this audiogram in this group box will appear if a Sound Level Meter was installed and the Retest on Noise Above MPANL check box was selected for the test configuration for this audiogram.

STS Calculation

The audiometer software calculates STS according to OSHA/MSHA guidelines. A baseline audiogram must be available from the database for the subject in question. The definition of an STS according to OSHA and MSHA can be found in the section Standard Threshold Shift (STS).

The available methods are listed in the sections beginning Standard Threshold Shift (STS).

You can program the audiometer software to calculate STS using Age Correction for a company by checking the ‘Calculate STS using Age Correction’ check box for the company. See Companies.

Adding an Audiogram

To add an audiogram:

1. In the Control Window, in Subject View, select the subject for whom you wish to add an audiogram.
   If the subject is not in the database yet, add the subject (see Adding a Subject).
2. From the Edit menu in the Control Window, choose Add, then Audiogram.
   The Add Test dialog box appears.

Copyright 2008 SRMi Consulting, LLC

3. If the audiogram is an OSHA STS Baseline and/or an OSHA Recordable Baseline, check the appropriate check box(es).
   Plus Package only: MSHA STS Baseline and Reportable Baseline are the available choices if you have chosen MSHA as the Regulation.
   Plus Package only: If you have chosen Automatic Baseline Revision for this company, the baseline(s) will be indicated in the subject's records automatically.
4. Enter the audiogram results in the Left Thresholds and Right Thresholds edit boxes.
5. Enter the examiner in the Examiner edit box, or look up the examiner by choosing the Examiner push button.
   For information on how to use look-up boxes, see Look-up Boxes .
6. Enter other information as applicable.
7. When finished, choose OK.

Modifying an Audiogram

To make changes to an audiogram:

1. In the Control Window, in Subject View, select the subject whose audiogram is to be modified.
2. Select the Audiogram tab.
3. In the Audiogram page, select the audiogram to be modified.
4. From the Edit menu in the Control Window, choose Modify, then Audiogram.
   The Modify Test dialog box appears.
5. Make changes as desired.
6. When finished, choose OK.

Deleting an Audiogram

To delete an audiogram:

1. In the Control Window, in Subject View, select the subject whose audiogram is to be deleted.
2. Select the Audiogram tab.
3. In the Audiogram page, select the audiogram to be deleted.
4. From the Edit menu, choose Delete, then Audiogram.
5. Choose Yes to delete the audiogram.

To delete all audiograms for the current subject:

1. From the Edit menu in the Control Window, choose Delete All, then Audiograms.
   The Delete All Audiograms dialog box appears.

Copyright 2008 SRMi Consulting, LLC

2. Choose Yes.
   The Delete All dialog box appears.
3. Type DELETE ALL in the edit box.
4. Choose OK to delete all audiograms for the current subject.

Subject History

PLUS PACKAGE ONLY

The Subject History contains information about the subject's medical history, and is stored along with the subject's audiograms in the database.

Certain questions in the Add History dialog box, when answered in the affirmative, result in an automatic medical referral on reports that indicate medical referral. The table below shows which questions result in a medical referral on such reports. (To see the Add History dialog box, choose Add from the Edit menu in the Control Window, then History.)

Tab Number	Question Type	Automatic Medical Referral on Reports Indicating Medical Referral
Tab 1	AAO Medical Referral Criteria Questions	Yes to any question
Tab 2	User-Defined Questions	No
Tab 3	User-Defined Questions	No

The AAO Medical Referral Criteria tab also contains statements for the examiner to respond to.

For the user-defined questions, you can add your own questions and set up default responses. See the following section.

You can see the History for a subject in Database View by selecting the subject in Subject View and then selecting the Histories tab. See Histories Tab.

Copyright 2008 SRMi Consulting, LLC

Subject History Questionnaire

PLUS PACKAGE ONLY

The subject history questionnaire lists questions for a given subject about medical history, and statements about the subject for the examiner to respond to.

The first part of the subject history contains the following questions, which are based on the AAO-HNS medical referral criteria of 1996:

1. Have you recently experienced pain in either ear?
2. Have you recently experienced a draining ear?
3. Have you recently experienced dizziness?
4. Have you recently experienced severe tinnitus (ringing)?
5. Have you recently experienced sudden hearing loss?
6. Have you recently experienced fluctuating hearing loss?
7. Have you recently experienced ear fullness or discomfort?
8. Have you recently had problems wearing hearing protection?

The second part of the subject history questionnaire is for the examiner only. The examiner indicates whether the subject has visible wax or an object in an ear, and whether the subject should be referred.

The third part of the subject history questionnaire is user-defined. The following are default questions about medical history. If you wish to change the default questions, see the instructions in the next section.

1. Have you ever served in the military?
2. Have you ever been to a doctor for an ear related problem?
3. Have you ever had a severe head injury?
4. Have you ever had ear surgery?
5. Have you ever had an ear injury?
6. Have you ever had measles?
7. Have you ever had mumps?
8. Have you ever had kidney disease?
9. Have you ever had scarlet fever?
10. Have you ever had meningitis?
11. Do you have diabetes?
12. Do you have high blood pressure?
13. Do you have an existing hearing problem?
14. Do you have frequent ear infections?

Copyright 2008 SRMi Consulting, LLC

15. Do you shoot guns or hunt?
16. Do you wear a hearing aid?
17. Do you participate in loud activities (music, motorcycle)?
18. Do you currently use prescription or over the counter drugs?
19. Are you currently suffering from allergies?
20. Does any of your immediate family have hearing problems?
21. Do you have any other comments on the health of your hearing?

User-Defined Questions for Subject History

PLUS PACKAGE ONLY

If you wish, you may include your own questions for Subject History, because some of the data fields are user-defined. The user-defined questions are those on Medical History Page 1 and Medical History Page 2. For general information on user-defined data fields, see User-Defined Data Fields.

To enter or modify user-defined questions for Subject History:

1. From the Edit menu in the Control Window, choose Add, then History.
   The Add History dialog box appears.
2. Choose the Medical History Page 1 tab.
3. Choose the push button of the question you wish to change.
   This data field's look-up dialog box appears.
4. Choose the Advanced push button.
   The dialog box expands.
5. In the Prompt edit box, change the question as desired.
6. Choose OK.
7. Continue until you have entered all your questions.
   If you have more than 10 of your own questions, you will need to enter the remaining questions using the Medical History Page 2 tab.
8. When finished with the Add History dialog box, choose Cancel.

Entering Responses to History Questions

PLUS PACKAGE ONLY

The responses to the AAO Medical Referral Criteria questions must be chosen either by pressing the question push button and selecting from the list in the look-up dialog box, or by selecting the 'Set AAO Medical Referral Responses to No' push button. Responses to these questions should be chosen from the list because these

Copyright 2008 SRMi Consulting, LLC

data fields have been designed as 'Lock to List' data fields. These data fields can be filled only if one selects from the choices in the field's look-up dialog box.

For user-defined questions, you have the option of setting up the data fields as 'Lock to List' fields using the Data Validation feature. See Data Validation for User-Defined Fields. Or you can create default responses to these fields. See the following section.

To enter a response to an AAO Medical Referral Criteria question:

1. Choose the push button for the question.
   The look-up dialog box for this data field appears.
2. Select the desired answer from the list box.
3. Choose OK.

To enter a response to a user-defined History question (on Medical History Page 1 or Medical History Page 2):

1. Follow the instructions for responses to AAO Medical Referral Criteria questions, above.

   -or-

1. Type the response in the edit box.

Default Responses to History Questions

PLUS PACKAGE ONLY

For user-defined History questions (Medical History Page 1 and Medical History Page 2), you may set up a default response. The AAO Medical Referral Criteria questions have no default option.

To enter a default response for a user-defined History question:

1. Choose the push button for the question.
   The look-up dialog box for this data field appears.
2. Choose the Advanced push button.
   The dialog box expands.
3. Enter the default response in the Default edit box.
4. Choose OK.
5. When finished with the Add History dialog box, choose OK.
   The next time you open the Add History dialog box, the default response will appear.

Copyright 2008 SRMi Consulting, LLC

Adding a History

PLUS PACKAGE ONLY

To add a history, follow the procedure below. Alternatively, you may choose the Add History push button in either the Assign dialog box or the Save/Print Test dialog box.

To add a history:

1. In Subject View in the Control Window, select the subject for whom you wish to add a history.
2. From the Edit menu, choose Add, then History.
   The Add History dialog box appears.
3. Enter the date and time in the Survey Date and Time edit boxes.
4. In the AAO Medical Referral Criteria tab, enter the subject's responses to the first eight questions.
   If the subject has answered 'No' to all questions, choose the 'Set Medical Referral Responses to No' push button.
5. Enter the examiner's response to the remaining two statements.
6. In the Medical History Page 1 tab and Page 2 tab, enter the subject's responses to the user-defined questions.
7. At the bottom of the Add History dialog box, enter a comment in the Comment edit box if desired.
8. Enter the examiner in the Examiner edit box, or look up the examiner by choosing the Examiner push button.
   For information on how to use look-up boxes, see Look-up Boxes .
9. When finished, choose OK.

Modifying a History

PLUS PACKAGE ONLY

To make changes to a history:

1. In Subject View in the Control Window, select the subject whose history you wish to modify.
2. Select the Histories tab.
3. In the Histories page, select the history to be modified.
4. From the Edit menu in the Control Window, choose Modify, then History.
   The Modify History dialog box appears.
5. Make changes as desired.

Copyright 2008 SRMi Consulting, LLC

6. When finished, choose OK.

Deleting a History

PLUS PACKAGE ONLY

To delete a history:

1. In the Control Window, select the Histories tab.
2. In the Histories tab, select the history to be deleted.
3. From the Edit menu in the Control Window, choose Delete, then History.
   The Delete History dialog box appears.
4. Choose Yes to delete the history.

To delete all histories for the current subject:

1. From the Edit menu in the Control Window, choose Delete All, then Histories.
   The Delete All Histories dialog box appears.
2. Choose Yes.
   The Delete All dialog box appears.
3. Type DELETE ALL in the edit box.
4. Choose OK to delete all histories for the current subject.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Analysis

Audiogram Analysis Columns

Messages will be displayed in the audiogram analysis columns in Audiogram View about what a given audiogram shows about the subject's hearing: e.g., STS, Improvement, etc. Messages can also indicate the status of the audiogram in the database, such as 'First Test'. In the following sections, the messages are described in alphabetical order.

The messages in the columns depend in part on the settings for the current company. For instance, if 'Separate Left/Right Baselines' has been selected for the company, the analysis columns will show separate baselines for each ear.

In another example, OSHA Recordable Shift ('Rec Shift') will appear in the columns instead of MSHA Reportable Shift, if OSHA has been selected for the company in the Regulation combo box (Plus Package only). (To see company settings, choose Company from the File menu in the Control Window.)

If 'Calculate STS using Age Correction' has been selected for the current company, age correction will be used in the calculation of STS and Recordable Shift (or Reportable Shift). If age correction has not been selected for the company, no age correction will be used in the calculations.

The column headings and abbreviations used are explained in the table below. For information on the Sound Level Meter Columns, see Sound Level Meter Columns .

Column Heading or Abbreviation	Explanation
L STS Shift	shift between this audiogram and the STS Baseline
L STS Analysis	explanation of the L STS Shift
L Rec Shift	shift between this audiogram and the Recordable Baseline
L Rec Analysis	explanation of the L Recordable Shift
L Rep Shift *	shift between this audiogram and the Reportable Baseline
L Rep Analysis *	explanation of the L Reportable Shift
STS Baseline	'X' indicates that this audiogram is the STS Baseline
L STS Baseline	'X' indicates that this audiogram is the STS Baseline for the left ear
R STS Baseline	'X' indicates that this audiogram is the STS Baseline for the right ear
Recordable Baseline	'X' indicates that this audiogram is the Recordable Baseline

Copyright 2008 SRMi Consulting, LLC

L Recordable Baseline	'X' indicates that this audiogram is the Recordable Baseline for the left ear
R Recordable Baseline	'X' indicates that this audiogram is the Recordable Baseline for the right ear
Reportable Baseline *	'X' indicates that this audiogram is the Reportable Baseline
L Reportable Baseline *	'X' indicates that this audiogram is the Reportable Baseline for the left ear
R Reportable Baseline *	'X' indicates that this audiogram is the Reportable Baseline for the right ear

* Plus Package only

Scale of Hearing Impairment

The Scale of Hearing Impairment used to categorize audiogram results is shown below.

dB Range	Impairment
-10 to 25	Normal
26 to 40	Mild Loss
41 to 55	Moderate Loss
56 to 70	Moderately Severe Loss
71 to 90	Severe Loss
91 Plus	Profound Loss

OSHA STS Baseline and MSHA STS Baseline

The STS Baseline is the baseline that is used for calculating STS. When calculating STS, the audiometer uses the most recent audiogram that is marked as the STS Baseline.

IF YOU DO NOT HAVE THE PLUS PACKAGE:

The OSHA STS Baseline check box appears in the Add Audiogram/Modify Audiogram dialog box. If any future audiogram for this subject is marked as the OSHA STS Baseline, the database will no longer regard the present audiogram as the STS baseline: that is, there is no need to go back to this audiogram and unselect the check box.

Copyright 2008 SRMi Consulting, LLC

IF YOU HAVE THE PLUS PACKAGE:

The STS Baseline check box appears in the Add Audiogram/Modify Audiogram dialog box if you have not chosen Automatic Baseline Revision for this company. (If, on the other hand, Automatic Baseline Revision is enabled, the check box will be gray and you will not be able to make changes to it.)

If you are using OSHA regulations for this company, the check box will be called OSHA STS Baseline; if you are using MSHA regulations, the check box will be called MSHA STS Baseline.

If any future audiogram for this subject is marked as the STS Baseline, the database will no longer regard the present audiogram as the STS baseline: that is, there is no need to go back to this audiogram and unselect the check box.

OSHA Recordable Shift & MSHA Reportable Shift

IF YOU DO NOT HAVE THE PLUS PACKAGE:

An OSHA Recordable Shift is an STS in either ear that results in a threshold average at 2000, 3000, and 4000 Hz of 25dB or greater in the same ear. The shift is calculated from the most recent audiogram having the OSHA Recordable Baseline check box selected.

IF YOU HAVE THE PLUS PACKAGE:

An MSHA Reportable Shift is an average shift at 2000, 3000, and 4000 Hz of 25dB or greater in either ear. The shift is calculated from the most recent audiogram having the MSHA Reportable Baseline check box selected. In the Analysis columns, an MSHA Reportable Shift is called ‘Rep Shift.’

If you are using OSHA regulations for this company, Recordable Shift will appear where appropriate, whereas if you are using MSHA regulations, ‘Reportable Shift’ or ‘Rep Shift’ will appear.

OSHA Recordable / MSHA Reportable Shift Baseline

The OSHA Recordable Shift Baseline is the baseline that is used for calculating OSHA Recordable Shift.

The MSHA Reportable Shift Baseline is the baseline that is used for calculating MSHA Reportable Shift.

IF YOU DO NOT HAVE THE PLUS PACKAGE:

The OSHA Recordable Shift Baseline check box appears in the Add Audiogram/Modify Audiogram dialog box. If any future audiogram for this subject is marked as the Recordable Shift Baseline, the database will no longer regard the present audiogram as the Recordable Shift (or Reportable Shift) baseline: that is, there is no need to go back to this audiogram and unselect the check box.

Copyright 2008 SRMi Consulting, LLC

IF YOU HAVE THE PLUS PACKAGE:

The OSHA Recordable Shift Baseline (or MSHA Reportable Shift Baseline) check box appears in the Add Audiogram/Modify Audiogram dialog box if you have not chosen Automatic Baseline Revision for this company. (If, on the other hand, Automatic Baseline Revision is enabled, the check box will be gray and you will not be able to make changes to it.)

If you are using OSHA regulations for this company, this audiogram will be the OSHA Recordable Shift Baseline audiogram for this subject. If you are using MSHA regulations for this company, this audiogram will be the MSHA Reportable Shift Baseline audiogram for this subject.

If any future audiogram for this subject is marked as the Recordable Shift (or Reportable Shift) Baseline, the database will no longer regard the present audiogram as the Recordable Shift (or Reportable Shift) baseline: that is, there is no need to go back to this audiogram and unselect the check box.

Annual Not Used

PLUS PACKAGE ONLY

The indication of Annual Not Used in an Analysis column means that the retest done after the annual audiogram is being used in place of the annual audiogram for STS calculation, baseline revision, and other evaluations. The annual audiogram is kept in the database, but is marked in such a way that it is not taken into account in such calculations.

Better

The indication of Better in an Analysis column means that the subject's thresholds at 2000, 3000, and 4000 Hz have improved at least an average of 3dB but less than an average of 5dB relative to the last audiogram performed.

First Test

The indication of First Test in an Analysis column means that this audiogram currently has the earliest time and date of all audiograms for this subject. This indication can change depending on the circumstances: for instance, if any earlier audiogram for this subject is subsequently imported into the database, the designation of First Test will be transferred to that audiogram.

Improvement

PLUS PACKAGE ONLY

The indication of Improvement in an Analysis column means that the subject's hearing has shown significant improvement according to the criteria established by the National Hearing Conservation Association in 2000. OSHA does not define

Copyright 2008 SRMi Consulting, LLC

significant improvement, but provides an example in the Hearing Conservation Amendment of an improvement of 5dB in the average of hearing thresholds at 2, 3, and 4 kHz. NHCA guidelines advise against the use of Age Correction.

This indication appears only if Automatic Baseline Revision has been enabled for this company.

Improvement, Persistent Improvement

PLUS PACKAGE ONLY

The indication of Improvement and Persistent improvement in an Analysis column means 1) that this subject's hearing shows both Improvement and Persistent Improvement in relation to the baseline audiogram, and 2) that this audiogram is the second audiogram in a row to show an Improvement for this subject. This indication appears only if at least six months (180 days) have passed since the first audiogram that showed an Improvement.

If you are using Age Correction for a company, Age Correction will be used when determining persistence.

This indication appears only if Automatic Baseline Revision has been enabled for this company.

Improvement, < 6 Month

PLUS PACKAGE ONLY

The indication of Improvement, < 6 Month in an Analysis column means that the subject's hearing has shown significant improvement according to the criteria established by the National Hearing Conservation Association in 2000, in two sequential tests, but that it has been less than six months (180 days) since the last audiogram for this subject was performed.

This indication appears only if Automatic Baseline Revision has been enabled for this company.

Missing or Invalid Data

The indication of Missing or Invalid Data in an Analysis column means either that 1) in this audiogram, there are data missing or some data are invalid, or 2) in the previous audiogram, there are data missing or some data are invalid. The database therefore cannot make a determination about what this audiogram shows.

For instance, if 'Calculate STS using Age Correction' is selected for the company of this subject, then the indication of Missing or Invalid Data in an Analysis column could mean that information about sex or birth date is missing for this subject.

In another example, if the previous audiogram was missing data and there was not enough data for the software to determine that whether the audiogram was "Better," "Worse," etc., 'Missing or Invalid Data' would appear for the current audiogram.

Copyright 2008 SRMi Consulting, LLC

If there is an indication of 'Missing or Invalid Data', you might want to consider whether using the NR Substitution feature for this company might be of help. The NR Substitution (dB) check box allows you to substitute a numerical value for any NR (No Response) indication in an audiogram. Substituting a number for NR may enable the software to analyze audiograms without an indication of 'Missing or Invalid Data.' For more information, see NR Substitution (dB).

Much Better

The indication of Much Better in an Analysis column means that the subject's thresholds at 2000, 3000, and 4000 Hz have improved an average of 5dB relative to the last audiogram performed.

Much Worse

The indication of Much Worse in an Analysis column means that the subject's thresholds at 2000, 3000, and 4000 Hz have worsened an average of 10dB relative to the last audiogram performed.

No Change

The indication of No Change in an Analysis column means that the subject's thresholds at 2000, 3000, and 4000 Hz have changed less than an average of 3dB relative to the last audiogram performed.

Persistent Improvement

PLUS PACKAGE ONLY

The indication of Persistent Improvement in an Analysis column means that this audiogram is the second audiogram in a row to show improvement in this subject's hearing over the baseline value. This indication appears only if at least six months (180 days) have passed since the first audiogram that showed improvement.

If you are using Age Correction for a company, Age Correction will be used when determining persistence.

This indication appears only if Automatic Baseline Revision has been enabled for this company.

Persistent STS

PLUS PACKAGE ONLY

The indication of Persistent STS in an Analysis column means that this audiogram has met the criteria for persistent STS as established by the National Hearing Conservation Association (NHCA) in 2000.

Copyright 2008 SRMi Consulting, LLC

If you are using Age Correction for a company, Age Correction will be used when determining persistence. STS is not analyzed as persistent when Age Correction is used under some circumstances. When the uncorrected shift of the subsequent test is the same as the shift of the original STS, but Age Correction adjustments make the subsequent test not an STS, the program does not analyze the STS as persistent and the baseline is not revised.

This indication appears only if Automatic Baseline Revision has been enabled for this company.

Recordable STS

The indication of Recordable STS in an Analysis column means that this audiogram shows a Recordable STS in relation to the baseline audiogram, according to the criteria established by OSHA.

This indication appears (where appropriate) if you are using OSHA regulations for this company.

Recordable STS Lined Out

The indication of Recordable STS Lined Out in an Analysis column means that this audiogram initially showed a Recordable STS in relation to the baseline audiogram, but that subsequent testing performed after the Retest Period as part of a hearing conservation program showed that the Recordable STS was not persistent according to the criteria established by the NHCA (National Hearing Conservation Association). In such cases, OSHA allows employers to erase or line out the initial finding of a Recordable Shift.

This indication appears (where appropriate) if you are using OSHA regulations for this company.

Rejected Test Data

The indication of 'Rejected test data' means that the Reject Audiogram check box in the Add Audiogram/Modify Audiogram dialog box was selected for this audiogram.

Repealed Recordable STS

The indication of Repealed Recordable STS in an Analysis column means that this audiogram initially showed a Recordable STS in relation to the baseline audiogram, but that subsequent testing performed within the Retest Period as part of a hearing conservation program did not show a Recordable STS.

Copyright 2008 SRMi Consulting, LLC

Repealed Reportable

PLUS PACKAGE ONLY

The indication of Repealed Reportable in an Analysis column means that this audiogram initially showed a Reportable Hearing Loss in relation to the baseline audiogram, but that subsequent testing performed within the Retest Period as part of a hearing conservation program did not show a Reportable Hearing Loss.

Repealed STS

The indication of Repealed STS in an Analysis column means that this audiogram initially showed an STS in relation to the baseline audiogram, but that subsequent testing performed within the Retest Period as part of a hearing conservation program did not show an STS.

Reportable Hearing Loss

PLUS PACKAGE ONLY

The indication of Reportable Hearing Loss in an Analysis column means that that this audiogram shows a Reportable hearing loss in relation to the baseline audiogram, according to the criteria established by MSHA.

This indication appears (where appropriate) if you are using MSHA regulations for this company.

Retest Not Used

PLUS PACKAGE ONLY

The indication of Retest Not Used in an Analysis column means that this retest audiogram is not being used for STS calculation, baseline revision, and other evaluations. For example, if a retest shows improvement in one ear but worse hearing in the other ear, the retest is not used.

This audiogram is kept in the database, but is marked in such a way that it is not taken into account in such calculations.

This indication appears only if Automatic Baseline Revision has been enabled for this company.

STS

The indication of STS in an Analysis column means that this subject's hearing shows an OSHA STS or MSHA STS in relation to the baseline audiogram. The Regulation setting for the company determines whether OSHA or MSHA regulations are used in calculating STS.

Copyright 2008 SRMi Consulting, LLC

STS, Persistent Improvement

PLUS PACKAGE ONLY

The indication of 'STS, Persistent improvement' in an Analysis column means 1) that this subject's hearing shows both an STS and Persistent Improvement in relation to the baseline audiogram, and 2) that this audiogram is the second audiogram in a row to show an Improvement for this subject. The baseline was then revised because persistence was shown, and the subject was found to have an STS in the current audiogram in relation to the revised baseline. This indication appears only if at least six months (180 days) have passed since the first audiogram that showed an Improvement.

The Regulation setting for the company determines whether OSHA or MSHA regulations are used in calculating STS.

If you are using Age Correction for a company, Age Correction will be used when determining persistence.

This indication appears only if Automatic Baseline Revision has been enabled for this company.

STS, Persistent STS

PLUS PACKAGE ONLY

The indication of 'STS, Persistent STS' in an Analysis column means 1) that this subject's hearing shows an STS in relation to the baseline audiogram, and 2) that this audiogram is the second audiogram in a row to show an STS for this subject. This indication appears only if at least six months (180 days) have passed since the first audiogram that showed an STS.

The Regulation setting for the company determines whether OSHA or MSHA regulations are used in calculating STS.

If you are using Age Correction for a company, Age Correction will be used when determining persistence. STS is not analyzed as persistent when Age Correction is used under some circumstances. When the uncorrected shift of the subsequent test is the same as the shift of the original STS, but Age Correction adjustments make the subsequent test not an STS, the program does not analyze the STS as persistent and the baseline is not revised.

This indication appears only if Automatic Baseline Revision has been enabled for this company.

STS, < 6 Month

The indication of STS, < 6 Month in an Analysis column means that the subject's hearing has shown an STS in two sequential tests, but that it has been less than six months (180 days) since the last audiogram for this subject was performed.

Copyright 2008 SRMi Consulting, LLC

The Regulation setting for the company determines whether OSHA or MSHA regulations are used in calculating STS.

Worse

The indication of Worse in an Analysis column means that the subject's thresholds at 2000, 3000, and 4000 Hz have worsened at least an average of 3dB but less than an average of 10dB relative to the last audiogram performed.

Sound Level Meter Columns

If a sound level meter is being used, the Sound Level Meter columns appear at the right of the Audiogram Analysis columns in Audiogram View in the Control Window. Messages will be displayed there about the sound level meter readings for a given audiogram. Information about the sound level meter itself is also given, e.g., its serial number and calibration date.

The column headings and abbreviations used are explained in the table below. See the following sections for more information.

Column Heading or Abbreviation	Explanation
AN Status	Ambient Noise Status
MPANL	Maximum Permissible Ambient Noise Level
NL	Noise Level
SLM	Sound Level Meter

NL Columns

The NL (Noise Level) columns indicate the set of last sound level readings taken by the Sound Level Meter during this audiogram.

If a Sound Level Meter was not installed in the system for this audiogram, these columns will be blank.

AN Status Column

The AN (Ambient Noise) column indicates 'In Range' if a Sound Level Meter was installed in the system and the Retest on Noise Above MPANLs check box was selected in the test configuration for this audiogram.

If a Sound Level Meter was not installed in the system for this audiogram, or if a Sound Level Meter was installed but the Retest on Noise Above MPANLs check box was not selected in the test configuration, these columns will be blank.

Copyright 2008 SRMi Consulting, LLC

MPANL Columns

If the Retest on Noise Above MPANLs check box was selected in the test configuration for this audiogram, the MPANL (Maximum Permissible Ambient Noise Level) columns list the MPANL for each frequency. The MPANLs listed are the ones that were selected in the test configuration for this audiogram.

If a Sound Level Meter was not installed in the system for this audiogram, or if a Sound Level Meter was installed but the Retest on Noise Above MPANLs check box was not selected in the test configuration, these columns will indicate 'None'.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Daily Calibration Storage

Daily Calibration Storage

PLUS PACKAGE ONLY

OSHA and MSHA require that each audiometer be given a daily calibration check. Daily Calibration Storage enables you to store daily calibration checks for multiple audiometers, thus providing you with evidence of compliance with OSHA or MSHA requirements.

There are factory-defined three daily calibration reports available: Daily Calibration Certificate, Daily Calibration Summary, and Daily Calibration LIst. In addition, custom daily calibration reports can be created.

Daily Calibration Storage data will be backed up and restored as part of normal backup and restore operations.

These data can be moved between product installations using Extract and Merge functions. See the Extract sections beginning with Extracting Records: An Overview and the Merge sections beginning with Merging Records: An Overview.

Daily Calibration Dialog Box

PLUS PACKAGE ONLY

In the Daily Calibration dialog box, the Audiometers list box shows all audiometers for which daily calibration checks have been stored. Push buttons at the right enable you to Add, Modify, Delete, or Delete all audiometers. If an audiometer is deleted, all the daily calibration audiograms for that audiometer will also be deleted.

The Audiograms list box shows all stored daily calibration checks for a given audiometer. Daily calibration audiograms are displayed for the audiometer that is currently selected above in the Audiometers list box. Push buttons at the right enable you to Add, Modify, Delete, or Delete all daily calibration tests.

The Print push button enables you to print a daily calibration report. When this button is selected, the Print Daily Calibration Report dialog box will be displayed, showing the report templates with associated select/sorts. See Daily Calibration Reports.

To see the Daily Calibration dialog box:

1. From the File menu in the Control Window, choose Daily Calibration.
   The Daily Calibration dialog box appears.

Copyright 2008 SRMi Consulting, LLC

Add Audiometer Dialog Box

PLUS PACKAGE ONLY

The Add Audiometer dialog box enables you to add an audiometer for Daily Calibration Storage.

The Serial Number edit box is for the audiometer serial number.

The Model edit box is for the audiometer model.

The Comment button enables you to add a comment.

To see the Add Audiometer dialog box:

1. From the File menu in the Control Window, choose Daily Calibration. The Daily Calibration dialog box appears.
2. Select the Add push button at the right of the Audiometers list box.

Adding an Audiometer

PLUS PACKAGE ONLY

To add an audiometer for daily calibration storage:

1. From the File menu in the Control Window, choose Daily Calibration. The Daily Calibration dialog box appears.
2. Select the Add push button at the right of the Audiometers list box. The Add Audiometer dialog box appears.
3. Enter the serial number of the audiometer in the Serial Number edit box.
4. Enter the audiometer model in the Model edit box.
5. If you wish to enter a comment, select the Comment push button.
6. When finished, choose OK.
7. When finished with the Daily Calibration dialog box, choose Close.

Modifying an Audiometer

PLUS PACKAGE ONLY

To modify an audiometer for daily calibration storage:

1. From the File menu in the Control Window, choose Daily Calibration. The Daily Calibration dialog box appears.
2. In the Audiometers list box, select the audiometer that you wish to modify.

Copyright 2008 SRMi Consulting, LLC

3. Select the Modify push button at the right of the Audiometers list box.
   The Modify Audiometer dialog box appears.
4. Make the desired changes.
5. When finished, choose OK.
6. When finished with the Daily Calibration dialog box, choose Close.

Deleting an Audiometer

PLUS PACKAGE ONLY

If an audiometer in Daily Calibration Storage is deleted, all the daily calibrations associated with that audiometer will also be deleted.

You will not be able to undo a delete operation.

To delete an audiometer for daily calibration storage:

1. From the File menu in the Control Window, choose Daily Calibration.
   The Daily Calibration dialog box appears.
2. In the Audiometers list box, select the audiometer that you wish to delete.
3. Select the Delete push button at the right of the Audiometers list box.
   The Delete Audiometer dialog box appears.
4. Choose Yes to delete the audiometer and all the daily calibrations associated with it.
5. When finished with the Daily Calibration dialog box, choose Close.

To delete all audiometers for daily calibration storage:

1. From the File menu in the Control Window, choose Daily Calibration.
   The Daily Calibration dialog box appears.
2. Select the Delete All push button at the right of the Audiometers list box.
   The Delete All Audiometers dialog box appears.
3. Choose Yes to delete all audiometers and all the daily calibrations associated with them.
4. In the Delete All Final Confirmation dialog box, enter the words DELETE ALL in the edit box.
5. Choose OK.
   All audiometers and daily calibrations will be deleted.
6. When finished with the Daily Calibration dialog box, choose Close.

Copyright 2008 SRMi Consulting, LLC

Daily Calibration Audiogram Dialog Box

PLUS PACKAGE ONLY

The Add Daily Calibration Audiogram dialog box allows you to add a daily calibration audiogram. The Modify Daily Calibration Audiogram dialog box allows you to modify a daily calibration audiogram.

In the Audiometer group box, the Serial No and Model fields show the serial number and model of the audiometer that is currently selected in the Daily Calibration Storage dialog box. These fields cannot be changed.

The Cal Date field is for the most recent annual calibration date as of the date of this calibration check. This edit box must be filled in with a valid date for the audiogram to be saved.

The Date and Time edit boxes are for the date and time, respectively, of the daily calibration check. These edit boxes are automatically filled in with today's date and the present time. Change these fields to the correct date and time if necessary.

The Reference check box allows you to mark this audiogram as a reference audiogram. If you are marking an audiogram as the reference audiogram, there is no need to go back to the previous reference and uncheck this box.

The Functional Check check box will already be checked if a a functional check was performed on the audiometer today. Subsequent functional checks on that day will select the check box in all daily calibration checks performed on that day. This feature allows you to perform the Functional Check either before or after the daily calibration.

The Simulator Serial No edit box is for the serial number of the simulator that was used in the calibration check.

The Examiner field is for the name of the examiner. You can set up a look-up box for this field with the Examiner push button. For more information, see Look-up Boxes.

The Comment edit box is for any comments by the technician about the daily calibration. You can set up a look-up box for this field using the Comment push button.

The Results box shows whether the audiometer passed the daily calibration check.

For information on the Sound Level Meter group box, see Sound Level Meter group box in the Audiogram section.

To see the Add/Modify Daily Calibration Audiogram dialog box:

1. From the File menu in the Control Window, choose Daily Calibration.
   The Daily Calibration dialog box appears.
2. Select an audiometer in the Audiometers list box.

Copyright 2008 SRMi Consulting, LLC

3. Choose the Add push button at the right of the Audiograms list box, or select a daily calibration audiogram and choose the Modify push button at the right of the Audiograms list box.

Adding a Daily Calibration Audiogram

PLUS PACKAGE ONLY

To add a daily calibration audiogram:

1. From the File menu in the Control Window, choose Daily Calibration.
   The Daily Calibration dialog box appears.
2. In the Audiometers list box, select the audiometer for which you are adding a daily calibration audiogram.
3. Select the Add push button at the right of the Audiograms list box.
   The Add Daily Calibration Audiogram dialog box appears.
4. Enter the daily calibration audiogram information.
   See Daily Calibration Audiogram Dialog Box for information on the different parts of this dialog box.
5. When finished, choose OK.
6. Choose Close in the Daily Calibration dialog box.

Modifying a Daily Calibration Audiogram

PLUS PACKAGE ONLY

To modify a daily calibration audiogram:

1. From the File menu in the Control Window, choose Daily Calibration.
   The Daily Calibration dialog box appears.
2. In the Audiometers list box, select the audiometer for which you wish to modify a daily calibration audiogram.
3. In the Audiograms list box, select the daily calibration audiogram for that audiometer that you wish to modify.
4. Select the Modify push button at the right of the Audiograms list box.
   The Modify Daily Calibration Audiogram dialog box appears.
5. Make changes to the daily calibration audiogram as desired.
6. When finished, choose OK.
7. Choose Close in the Daily Calibration dialog box.

Copyright 2008 SRMi Consulting, LLC

Deleting a Daily Calibration Audiogram

PLUS PACKAGE ONLY

To delete a daily calibration audiogram:

1. From the File menu in the Control Window, choose Daily Calibration.
   The Daily Calibration dialog box appears.
2. In the Audiometers list box, select the audiometer for which you wish to delete a daily calibration audiogram.
3. In the Audiograms list box, select the daily calibration audiogram for that audiometer that you wish to delete.
4. Select the Delete push button at the right of the Audiograms list box.
   The Delete Daily Calibration Audiogram dialog box appears.
5. Choose Yes to delete the daily calibration audiogram.
6. Choose Close in the Daily Calibration dialog box.

To delete all daily calibration audiograms for an audiometer:

1. From the File menu in the Control Window, choose Daily Calibration.
   The Daily Calibration dialog box appears.
2. In the Audiometers list box, select the audiometer for which you wish to delete all daily calibration audiograms.
3. Select the Delete All push button at the right of the Audiograms list box.
   The Delete All Daily Calibration Audiograms dialog box appears.
4. Choose Yes to delete all the daily calibration audiograms for this audiometer.
   The Delete All Final Confirmation dialog box appears.
5. Type DELETE ALL in the edit box.
6. Choose OK.

Updating the Daily Calibration Reference Test

If you are updating the reference audiogram at the end of the daily calibration test, use the first procedure below. If you have the Plus Package and wish to add a daily calibration reference or mark a stored daily calibration as the reference, see the second part of this section.

To update the reference audiogram for daily calibration at the end of the test:

1. From the Daily Calibration submenu in the Audiometer menu in the Control Window, choose Save/Print.
   The Save/Print Daily Calibration dialog box appears.

Copyright 2008 SRMi Consulting, LLC

2. Select the Reference check box.
3. Enter other information as desired.

- (Plus Package Only:) Choose the Save push button. This action stores the audiogram as the reference audiogram in Daily Calibration Storage.
- (Do Not Have Plus Package:) Choose the Update Reference push button, then the Close push button.
  The current data is now stored as the new baseline (reference) audiogram.

PLUS PACKAGE ONLY

The instructions below describe how to mark a stored daily calibration audiogram as the reference audiogram. If you are manually entering the daily calibration audiogram, and wish to mark it as the reference audiogram, follow the instructions in Adding a Daily Calibration Audiogram, taking care to select the Reference check box.

To mark a stored daily calibration audiogram as the reference audiogram:

1. From the File menu in the Control Window, choose Daily Calibration.
   The Daily Calibration dialog box appears.
2. In the Audiometers list box, choose the audiometer on which the daily calibration check was performed.
3. In the Audiograms list box, choose the daily calibration audiogram that you wish to mark as a reference.
4. Select the Modify push button at the right of the Audiograms list box.
   The Modify Daily Calibration Audiogram dialog box appears.
5. Select the Reference check box.
6. Choose OK.
7. In the Daily Calibration dialog box, choose Close.

Daily Calibration Reports

IF YOU DO NOT HAVE THE PLUS PACKAGE:

One daily calibration report is available: the Daily Calibration Certificate report.

PLUS PACKAGE ONLY

There are three factory-defined daily calibration reports available: Daily Calibration Certificate, Daily Calibration Summary, and Daily Calibration LIst. In addition, any custom daily calibration reports that have been added will appears in the Print Daily Calibration Report dialog box. See Custom Reports for information on custom reports.

Copyright 2008 SRMi Consulting, LLC

To see the available daily calibration reports:

1. From the File menu in the Control Window, choose Daily Calibration.
   The Daily Calibration dialog box appears.
2. Choose the Print push button.
   The Print Daily Calibration Report dialog box appears.

Daily Calibration Certificate report

PLUS PACKAGE ONLY

The Daily Calibration Certificate report shows the test data of a daily calibration check.

For this report, there are three Select/Sorts available: Current Audiometer, Test Date Range, and All.

'Test Date Range' will select all daily calibrations for audiometers that have a daily calibration in that range.

On the report, the Audiograms section shows the daily calibration check results, and compares these results with the reference audiogram. The deviation from reference, if any, is displayed.

For information on the Sound Level Meter section, see Reports.

The Results section shows whether the daily calibration passed or failed, with an explanation.

The Key section shows that the thresholds are listed in dB HL, and explains abbreviations that may appear in the report.

Daily Calibration Summary report

PLUS PACKAGE ONLY

The Daily Calibration Summary report shows the test data of multiple calibration checks.

There are four Select/Sorts available for this report: Current Audiometer, Test Date Range, Test Date Range Exclusive, and All.

If 'Current Audiometer' is chosen, all calibration checks will be printed for this audiometer.

'Test Date Range' will select all daily calibrations for audiometers that have a daily calibration in that range.

'Test Date Range Exclusive' will select only daily calibrations in that range.

On the report, the Audiograms section shows the daily calibration check data for each test. The Results column indicates whether each calibration check passed or failed.

Copyright 2008 SRMi Consulting, LLC

The Results section shows whether the latest daily calibration check passed or failed, with an explanation.

The Key section shows that the thresholds are listed in dB HL, and explains abbreviations that may appear in the report.

Daily Calibration List report

PLUS PACKAGE ONLY

The Daily Calibration List report shows the latest daily calibration check and the reference audiogram for multiple audiometers.

There are two Select/Sorts available for this report: Test Date Range and All.

Test data is shown from the most recent daily calibration check and the reference audiogram. An indication of PASSED or FAILED is given for the most recent daily calibration check.

In the Totals section, the Period line shows the time period covered by the report. The total number of audiometers included in the report is shown, and the number of audiometers that have passed the daily calibration check is displayed.

The Key section shows that the thresholds are listed in dB HL, and explains abbreviations that may appear in the report.

For information on the Sound Level Meter section, see Reports.

Print Daily Calibration Report Dialog Box

PLUS PACKAGE ONLY

The Print Daily Calibration Report dialog box shows the available report templates and select/sorts. There are three report templates available, which are listed in the Report Template list box. See the following sections for descriptions of the reports.

In the Report Select/Sort list box, the available Select/Sorts appear for the Report Template that is currently selected. ‘Test Date Range’ will select all daily calibrations for audiometers that have a daily calibration in that range. ‘Test Date Range Exclusive’ will select only daily calibrations in that range.

If the Print to Screen check box is selected, the report will be printed to the screen instead of to a printer.

The Copies control allows you to choose the number of copies that will be printed.

If you create a custom report, you can specify "Daily Calibration" as a report type, and your report will appear in the Report Template list in this dialog box. See Custom Reports for information on creating custom reports.

To see the Print Daily Calibration Report dialog box:

1. From the File menu in the Control Window, choose Daily Calibration.
   The Daily Calibration dialog box appears.

Copyright 2008 SRMi Consulting, LLC

2. Choose the Print push button.
   The Print Daily Calibration Report dialog box appears.

Printing a Daily Calibration Report

PLUS PACKAGE ONLY

To print a daily calibration audiogram:

1. From the File menu in the Control Window, choose Daily Calibration.
   The Daily Calibration dialog box appears.
2. In the Audiometers list box, choose the audiometer for which you are printing a daily calibration report.
3. In the Audiograms list box, choose the audiogram that you wish to print.
4. Choose the Print push button.
   The Print Daily Calibration Report dialog box appears.
5. Choose the desired report in the Report Template list box.
6. Choose the Select/Sort in the Report Select/Sort list box.
7. Select the Print to Screen check box if you wish to print to screen.
8. Select the number of copies using the Copies control.
9. Choose the Print push button.

Copyright 2008 SRMi Consulting, LLC

Reports

Reports

The following sections describe the report templates and features that are available. The reports are listed in alphabetical order. You can sort the data for reports in various ways using the Select/Sort feature, with options such as ‘Test Date Range’ and ‘Subject Range', and (with the Plus Package) ways to specify detailed selection criteria for multiple fields. See Select/Sorts for more information.

(This dialog box has no effect on the report that print at the end of a test. To select or change the report that prints at the end of a test, see Save/Print Options.)

The Report Template list box shows the report templates available. See _____.

The Report Select/Sort list box shows the select/sorts available for the report template that is currently selected in the Report Template list box. When the Print push button is chosen, the Report Record Selection dialog box will appear for the currently selected Select/Sort, enabling you to specify selection criteria for multiple fields at a time. For example, you can arrange to print audiograms only within a certain date range and only for male subjects who are in HC programs. See Select/Sorts for more information.

Some aspects of the reports depend on company settings: for example, if you wish the reports for a company to calculate STS using Age Correction, be sure that the ‘Calculate STS using Age Correction’ check box for the company is selected. For more information, see Company Settings .

If you run the Sound Level Meter during an audiogram, and Retest on Noise Above MPANLs was selected in the Test Configuration, the report for that audiogram will state that the MPANLs were not exceeded. However, if you enter Sound Level Meter results manually, or use the Sound Level Meter without the Retest on Noise Above MPANLs feature selected, the report will make no statement about noise levels, even if the MPANLs were not exceeded.

In the descriptions below of the reports, the phrase "current audiogram" is used to mean "the most recent analyzed audiogram." The "current audiogram" is not necessarily the most recent audiogram. Because of retests and NHCA baseline revision, the current test is not always the most recent one. The "current audiogram" is the audiogram that is used for analysis and calculations. However, if Automatic Baseline Revision is not enabled for a company, the "current audiogram" is indeed the most recent test, unless the most recent test has been rejected.

In reports, a distinction is made between the most recent test and the "current" test. A "current" test is defined here as the most recent analyzed test. Because of retests and NHCA* baseline revision, the test that is used for analysis and calculations is not always the most recent one. A test that turns out not to be used, such as an "Annual Not Used" or a rejected test, is not an analyzed test. So, for instance, there

Copyright 2008 SRMi Consulting, LLC

could be a "current" test that was performed two weeks and a "most recent" test that was performed today.

Reports will be backed up and restored as part of normal backup and restore operations, since they are part of the database.

Reports will be included in an Extract or Merge operation that uses either the "All" configuration or the "Utility Record Groups" configuration.

To see the Print Report dialog box:

1. From the Report menu in the Control Window, choose Print.

PLUS PACKAGE ONLY:

Using Report Options, you can add custom report templates or select/sorts, or change the order of the factory-defined templates or select/sorts; see Report Options.

If you create custom Extract or Merge configurations, you can choose to include or exclude the "Report" record group.

For Daily Calibration reports, see Daily Calibration Reports.

*National Hearing Conservation Association

Baseline Codes in Reports

Some reports show a Baseline column with information about whether an audiogram is a baseline, and if so what type. The Regulation setting for the company determines whether OSHA or MSHA regulations have been used in calculations (Plus Package only). Refer to the table below:

Baseline Code	Baseline Type
S	OSHA STS Baseline (or MSHA STS Baseline)
R	OSHA Recordable Shift Baseline (or MSHA Reportable Shift Baseline)
SR	OSHA STS Baseline (or MSHA STS Baseline) and OSHA Recordable Shift Baseline (or MSHA Reportable Shift Baseline)
(blank)	Annual

Copyright 2008 SRMi Consulting, LLC

Printing a Report

To print a report:

1. In the Control Window, choose Print from the Report menu.
   The Print Report dialog box appears.
2. Select the Report Template in the Template list box.
   The Report Templates are discussed in the following sections.
3. Choose the Select/Sort method in the Select/Sort list box.
   If you choose a range of dates or subjects, you will be asked to enter the start and end dates and/or names.
4. Choose whether to print to screen using the Print to Screen check box.
5. Choose the number of copies.
6. Choose the Print push button.

Medical Referral

There will be an automatic medical referral on any report that indicates a medical referral if 'Yes' is the response to the 'Refer Subject' question of the current audiogram. (This question appears in the Add Audiogram or Modify Audiogram dialog box.) A positive response to this question on any audiogram that is not the latest one has no bearing on a possible medical referral.

The AAO (American Academy of Otolaryngology) criteria for Medical Referral are listed in the Hearing Conservation Manual published by CAOHC (Council for Accreditation in Occupational Hearing Conservation).

An audiogram that has been rejected by means of the Reject Audiogram check box (in the Add Audiogram/Modify Audiogram dialog box) has no bearing on a possible medical referral.

PLUS PACKAGE ONLY

In a Subject History, if any of the AAO Medical Referral Criteria questions results in an affirmative answer, there will be an automatic medical referral on any report that indicates a medical referral.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Report Templates: Subject Reports

Subject Averages and Impairments

The Subject Averages and Impairments report analyzes the current audiogram given to the subject. The report has a section at the bottom of the report that shows calculations by the audiometer of STS (Standard Threshold Shift), PBI (Percent Binaural Impairment), and averages.

Subject History Questionnaire Report

PLUS PACKAGE ONLY

This report shows the Subject History Questionnaire that appears in the Add History/Modify History dialog boxes. Some of the questions are user-definable. (To see the Subject History Questionnaire in the Add History dialog box, choose Add from the Edit menu in the Control Window, then History.) For more information on Subject Histories and the Subject History Questionnaire, see Subject History and Subject History Questionnaire .

Subject Notification Letter

PLUS PACKAGE ONLY

This report is the letter that is given to the subject notifying him or her of the results of his or her current hearing test. If one or more baselines exist for this subject, information on the baseline(s) is also included in the letter. The letter informs the subject whether his or her current results show a standard threshold shift as defined by OSHA (or MSHA, a regulation setting available with the Plus Package).

Only the administrator can modify the notification letter.

You have the option of including or excluding test data and other information. See the table below.

Optional in the Notification Letter
Social Security number
test data
signature line
Medical Referral
title

If a medical referral is indicated for this subject, the Medical Referral section should be included. The AAO (American Academy of Otolaryngology) criteria for medical

Copyright 2008 SRMi Consulting, LLC

referral are listed in the Hearing Conservation Manual published by CAOHC (Council for Accreditation in Occupational Hearing Conservation). For information on how the database handles medical referral, see Medical Referral.

The letter will print in the language specified in the Language combo box in the subject's demographic data (in the Add Subject or Modify Subject dialog box).

In order to add a language for the Notification Letter, follow the instructions for adding a language in Languages and Adding a Language. Then choose Modify Letter from the Report menu in the Control Window, choose the language that you just added in the Language combo box, and enter the words and paragraphs of the Notification Letter for that language. (English words and paragraphs appear by default; replace them with the new texts.) When you are ready to print the letter, simply set the new language as the preferred language of a given subject, and the letter for that subject will be printed in the new language.

To see the Notification Letter dialog box:

1. From the Report menu in the Control Window, choose Modify Letter.

Notification Letter Dialog Box

PLUS PACKAGE ONLY

In the Notification Letter dialog box, the Language combo box shows the twelve languages for which there are factory-defined texts and words for the letter. When a language is chosen, the texts and individual words of the letter appear in that language.

The Language combo box shows the sixteen factory languages. Any language added by means of the Languages dialog box will appear here also.

The General page shows the elements of the letter that can be included or excluded: Subject ID, test data, signature line, Medical Referral, and title.

The text and words on the Paragraph, Medical Referral, and Words pages can be changed.

The Paragraphs page shows the paragraphs of the letter.

The Medical Referral page shows sentences relating to medical referral.

The Words page shows words or phrases that will appear on different sections of the letter.

The four edit boxes on the Title page represent the four possible lines of the title.

To see the Notification Letter dialog box:

1. From the Report menu in the Control Window, choose Modify Letter.

Copyright 2008 SRMi Consulting, LLC

Modifying the Notification Letter

PLUS PACKAGE ONLY

Only users with administrator access can modify the Notification Letter.

To modify the notification letter:

1. From the Report menu in the Control Window, choose Modify Letter.
   The Notification Letter dialog box appears.
2. Using the Language combo box, select the language for which you wish to modify the letter.
3. In the General tab, select the information to be shown on the letter.
4. Choose the Paragraphs tab.
5. In the Paragraphs tab, make changes to the texts as desired.
6. Choose the Medical Referral tab.
7. Make changes to the statements as desired.
8. Choose the Words tab.
   This tab shows the different words used in the notification letter.
9. Change the words as desired.
10. Choose the Title tab.
11. Make changes to the notification letter title as desired.
    The four edit boxes represent the four possible lines of the title.
12. When finished with the Notification Letter dialog box, choose Close.

Subject History Report

PLUS PACKAGE ONLY

This report shows the Subject History. Some of the questions for the Subject History are user-definable. (To see the Subject History Questionnaire in the Add History dialog box, choose Add from the Edit menu in the Control Window, then History.) For more information on Subject Histories and the Subject History Questionnaire, see Subject History and Subject History Questionnaire .

Subject Summary

This report provides an analysis of the current audiogram of the subject, and shows how this test compares with the STS Baseline audiogram in audiogram graphs for left and right. The other audiograms for this subject are also printed.

Copyright 2008 SRMi Consulting, LLC

Subject Test

This report gives you a summary of the subject's current test and demographic data, without STS analysis.

Subject Test STS

This report gives you a summary of the subject's current audiogram and demographic data, including STS analysis. Age Correction data will appear on this report if you are using Age Correction for this company.

Copyright 2008 SRMi Consulting, LLC

Report Templates: Company Reports

All Company List

PLUS PACKAGE ONLY

This report lists all the companies that are currently in the database, together with the information that has been entered about them, such as their address and phone number.

Company Baseline Revision List

PLUS PACKAGE ONLY

The Company Baseline Revision LIst report shows all subjects whose current audiogram shows a persistent STS or persistent improvement according to the criteria established by the National Hearing Conservation Association (NHCA) in 2000. If you wish to print this report, Automatic Baseline Revision must be enabled for this company.

Company Exception List

PLUS PACKAGE ONLY

This report lists all subjects who may not appear correctly in other reports due to missing or invalid data.

Company Medical Referral List

PLUS PACKAGE ONLY

This report lists the subjects in a company who meet the criteria for medical referral based on the results of their baseline or annual audiogram.

The criteria used in the report are those listed in "Otologic Referral Criteria for Occupational Hearing Conservation Programs," American Academy of Otolaryngology – Head and Neck Surgery Foundation, Inc., approved 1996.

Company Recordable Reportable Shift List

PLUS PACKAGE ONLY

This report shows all the subjects in the company whose current test results indicate an OSHA Recordable Shift or MSHA Reportable Shift. Age Correction data will appear on this report if the 'Calculate STS using Age Correction' check box in the Add Company or Modify Company dialog box has been selected.

Copyright 2008 SRMi Consulting, LLC

Company Recordable Shift Line Out List

PLUS PACKAGE ONLY

This report shows all subjects in the company whose current test results indicate that an OSHA Recordable Shift shown on an earlier audiogram was not persistent. The Recordable Shift is therefore lined out.

Company Roster

This report shows the raw data and percentages of STS, Recordable Shifts, and hearing impairment in the company.

Company Retest List

PLUS PACKAGE ONLY

This report lists all subjects in a company whose current test results indicate an STS as defined by OSHA and MSHA, and who therefore are to be retested within the Retest Period.

Company STS Exception List

PLUS PACKAGE ONLY

This report lists all subjects in a company who may not appear correctly in other reports due to missing or invalid data.

Company STS List

PLUS PACKAGE ONLY

This report shows all the subjects in the company whose current test results indicate an STS as defined by OSHA and MSHA. A summary of the subjects' test results is provided along with their names. Age Correction data will appear on this report if the 'Calculate STS using Age Correction' check box in the Add Company or Modify Company dialog box has been selected.

Company Summary

PLUS PACKAGE ONLY

This report shows the raw data and percentages of STS, Recordable Shifts, and hearing impairment of all subjects in the company. Pie charts are shown for the various results.

Copyright 2008 SRMi Consulting, LLC

Company Test Schedule List

PLUS PACKAGE ONLY

This report produces a list of subjects to be tested.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Report Select/Sorts

Select/Sorts

Select/Sorts for reports enable to you to specify what data will be included in a report. The Select/Sort list box in the Print Report dialog box shows the select/sort available for the report template that is currently selected in the Template list box.

If you choose Current Subject, the report will print all audiograms for the subject that is currently selected.

If you choose a range of subjects, the report will print for any subjects who have a name in the given range.

If you choose All Subjects, all subjects with all their audiograms will appear on the report.

If you choose Test Date Range, the report will print all audiograms for all subjects with an audiogram in that date range.

'HC Program' stands for 'Hearing Conservation Program.'

PLUS PACKAGE ONLY:

If you choose History Date Range, the report will print all histories for all subjects with a history in that date range.

Report Selection Criteria

The Report Selection Criteria feature enables you to specify a large number of variables in your search for the data that you need on the currently selected report. The Report Record Selection dialog box is described in this section.

[current subject]

"[current subject]" means the subject that is currently selected. The name of the subject does not actually appear.

"to"

The word "to" to the left of an edit box indicates that records with a value up to and including the value entered in that edit box will be included in the report. For example, if 12/13/1978 is entered in the edit box preceded by "to" in the Birth Date row, the report will include all subjects with birth dates before or on this date.

The word "to" at the right of an edit box indicates that records with a value equal to and greater than the value entered in that edit box will be included in the report. For example, if 11/20/1950 is entered in the edit box that precedes the word "to", the report will include all subjects with birth dates on or after this date.

Copyright 2008 SRMi Consulting, LLC

"or"

The word "or" to the left of an edit box indicates that the report will include records with values corresponding to the value in this edit box.

[today]

"[today]" means the current date (the system date). The date does not actually appear.

Blank Values

Specifying "[blank value]" for a field will return records that contain no data in that field. For instance, suppose that the person entering demographic data for a woman named Mary Malloy forgot to enter F in the Sex field. That omission would result in Mary not being included in reports specifying female subjects. Such omissions can be corrected by doing a report of records with blank values for a given field (in this case, Sex), and then finding those records and supplying the missing data.

Nonblank Values

Specifying "[nonblank value]" for a field will return records that contain data in that field.

View SQL

The View SQL push button enables you to see the SQL for the currently selected settings.

Show Database Counts

If this check box is selected, the number of records with a given value for a given field will be listed beside the value in the dropdown list for those fields that currently have a dropdown list. For example, if there are 45 subjects whose language is Spanish, the number 45 will appear beside "Spanish" in the combo box list.

Show Database Values

If this check box is selected, the arrow for the combo box will appear for the following edit boxes: SSN, Location, City, State, Zip, and Email.

"*" (Asterisk)

An single asterisk by a field name indicates that in the dropdown list for that field, a database value appears for each entry.

Date format (Birth Date, Hire Date)

The date format is MM/DD/YYYY.

Copyright 2008 SRMi Consulting, LLC

Set Defaults

The Set Defaults push button returns all settings in this dialog box back to the default settings.

Count Records

The Count Records push button instructs the database to count the total number of records in this company and to display the number below in the gray box labeled "Total".

In the Print Report dialog box, the contents of the Report Select/Sort list box will vary according to the Report Template that is currently selected at left. The Select/Sorts that are available are the following:

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Report Options

Report Options

PLUS PACKAGE ONLY

Report Options allows you to add, modify, and delete custom report templates and select/sorts for reports. You can also make changes to the order of factory-defined report templates and select/sorts in the list. The factory-defined templates and select/sorts themselves cannot be modified or deleted.

The Template list box shows the report templates available.

The Select/Sort list box shows the select/sorts available for the report template that is currently selected in the Template list box.

The Add, Modify, and Delete push buttons at the right of the Template and Select/Sort list boxes enable you to add and make changes to custom report templates and select/sort methods. See the sections below for more information.

Use the Item Up and Item Down push buttons to move often-selected items to the top of the list. The Item Up push buttons will move the list item that is currently selected up in the list. The Item Down push buttons will move the list item that is currently selected down in the list.

To see the Report Options dialog box:

1. Choose Options from the Reports menu in the Control Window.
   The Report Options dialog box appears.

Custom Reports

PLUS PACKAGE ONLY

If you have the necessary proficiency with the third-party Crystal Reports software, you can add an entirely new report template, or copy and then modify an existing report template. These operations are discussed in the sections below. The procedure for deleting a custom template is also given.

Custom reports and select/sorts are backed up and restored as part of normal backup and restore operations, since they are part of the database.

These data can be moved between product installations using Extract and Merge functions. See the Extract sections beginning with Extracting Records: An Overview and the Merge sections beginning with Merging Records: An Overview.

Copyright 2008 SRMi Consulting, LLC

Adding a Report: An Overview

PLUS PACKAGE ONLY

Adding a new report template is done in the following way. First create a report template file using Crystal Reports. Then, in the Report Options dialog box, choose the Add button. You will see the Add Template dialog box. In the Name edit box, you can enter the name that you wish the report to have in the database. Choose the report type for your new report using the Report Type combo box. The report type that is chosen determines the dialog box(es) that the report you are adding will appear in. The report type choices are listed below.

Report Types
Company/Subject/Audiogram
Daily Calibration
Annual Calibration
SLM Annual Calibration

Then you can choose the Import Report File push button. The Select Report File dialog box appears. Browse to your file and select it. Choose Open. Then you are ready to choose OK in the Add Template dialog box. In the Report Options dialog box, you can verify that your new report appears in the Template list box (you may have to move the scroll bar to see the bottom of the list).

In the Add Template dialog box, the Name edit box is for the name that the new report will have in the database.

The Report Type combo box lists the available report types. The selection made here will determine which dialog boxes the report will appear in.

The Import Report File push button imports a report file. When chosen, this push button causes the Select Report File dialog box to appear. You can browse to the file that you wish to import and choose Open.

To see the Report Options dialog box:

1. Choose Options from the Reports menu in the Control Window.
   The Report Options dialog box appears.

Modifying a Report: An Overview

PLUS PACKAGE ONLY

This section describes how to copy and modify a factory-defined report.

First, copy the report file. Any report in the Report Options dialog box, including the factory-defined report templates, can be copied by selecting the report in the Templates list box and then choosing the Modify push button. In the Modify

Copyright 2008 SRMi Consulting, LLC

Template dialog box, you will export the file by selecting the Export Report file push button, browsing to a file and selecting it, and choosing Open. (Then choose Close in the Modify Template dialog box). In this operation, the file that you browsed to is overwritten with the report from the Report Options dialog box. This copy of the report can then be modified using Crystal Reports. No changes will be made to the actual report in the database.

The second step is importing the file that you copied and then modified. In the Report Options dialog box, choose the Add push button. In the Add Template dialog box, enter the name that you wish your new report to have in the database. Choose the report type for your new report using the Report Type combo box. The report type that is chosen determines the dialog box(es) that the report you are adding will appear in. The report type choices are listed below.

Report Types
Company/Subject/Audiogram
Daily Calibration
Annual Calibration
SLM Annual Calibration

Finally, choose the Import Report File push button and browse to the report file that you modified. Select the report file and choose Open. In the Modify Template dialog box, choose OK. Your new report will appear in the Report Options dialog box.

Modify Template Dialog Box

In the Modify Template dialog box, the Name edit box shows the name of the report that you selected in the Report Options dialog box. If the report you selected in the Report Options dialog box is a factory-defined one, this edit box is gray (cannot be changed). If, on the other hand, the report you selected is not factory-defined, the contents of the Name edit box can be changed. If the contents are changed, the new name of the report will appear in Report Options after you choose OK in the Modify Template dialog box.

The Report Type combo box lists the available report types. The selection made here will determine which dialog boxes the report will appear in.

The Import Report File push button imports a report file. When chosen, this push button causes the Select Report File dialog box to appear. You can browse to the file that you wish to import and choose Open. This push button appears only if a custom report has been chosen in the Report Options dialog box. It does not appear if a factory-defined report was chosen.

The Export Report File push button exports a report file. When chosen, this push button causes the Select Report File dialog box to appear. You can browse to a file

Copyright 2008 SRMi Consulting, LLC

and choose Open. The file that you browsed to will be overwritten with the report from the Report Options dialog box.

To see the Report Options dialog box:

1. Choose Options from the Reports menu in the Control Window.
   The Report Options dialog box appears.

Adding a Report Template

PLUS PACKAGE ONLY

To add a report template:

1. Choose Options from the Reports menu in the Control Window.
   The Report Options dialog box appears.
2. Choose the Add push button in the Template group box.
   The Add Template dialog box appears.
3. Enter the name of the new template in the Name edit box.
4. Choose the report type in the Report Type combo box.
5. Choose the Import Report File push button.
   The Select Report File dialog box appears.
6. Browse to the file that you have created using Crystal Reports, and select the file.
   The file name and extension will appear in the File name edit box.
7. Choose Open.
   The Add Template dialog box appears.
8. Choose OK.
   The Report Options dialog box appears. The new report will appear in the Template list box. You may have to scroll down to see it in the list.
9. When finished with the Report Options dialog box, choose Close.

Modifying a Report Template

PLUS PACKAGE ONLY

To modify a report template:

1. Choose Options from the Reports menu in the Control Window.
   The Report Options dialog box appears.
2. Select the report you wish to modify in the Templates list box.
3. Choose the Modify push button.
   The Modify Template dialog box appears.;
4. Choose the Export Report File push button.
   The Select Report File dialog box appears.

Copyright 2008 SRMi Consulting, LLC

5. Browse to a file and select the file.
   The file name and extension will appear in the File name edit box.
6. Choose Open.
   The file that you browsed to will be overwritten by the report that you chose in the Report Options dialog box. You now have a copy of the report that you chose.
7. Make changes to the report file using Crystal Reports.
8. In the Modify Template dialog box, choose the Import Report File push button.
   If the report that you originally chose to make a copy of was a factory-defined one, this push button will not appear in this dialog box. Follow the instructions for Adding a Report Template instead.
   The Select Report File dialog box appears.
9. Browse to the report file and select it.
10. Choose Open.
    The Modify Template dialog box appears.
11. Choose OK.
    Your report file in the database will be overwritten with the file that you browsed to.
12. When finished with the Report Options dialog box, choose Close.

To change the name of a custom report template:

1. Choose Options from the Reports menu in the Control Window.
   The Report Options dialog box appears.
2. Select the custom template whose name you wish to change in the Template list.
3. Choose the Modify push button.
   The Modify Template dialog box appears.
4. Change the name in the Name edit box.
5. Choose OK.
   The Report Options dialog box appears. The report now has its new name.
6. When finished with the Report Options dialog box, choose Close.

Deleting a Report Template

PLUS PACKAGE ONLY

Factory-defined reports cannot be deleted.

To delete a custom report template:

1. Choose Options from the Reports menu in the Control Window.
   The Report Options dialog box appears.
2. Select the custom template you wish to delete in the Template list.

Copyright 2008 SRMi Consulting, LLC

3. Choose the Delete push button.
   The Delete Template dialog box appears.
4. Choose Yes to delete the template.
5. When finished with the Report Options dialog box, choose Close.

Custom Select/Sorts

PLUS PACKAGE ONLY

Adding a select/sort is done using Structured Query Language (SQL), to which two functions have been added, the ASK() function and the ASKSYS() function. Refer to Database Field Definitions for table names and field names. See the following sections for information on these two functions, and procedures relating to custom select/sorts.

Adding a Select/Sort

PLUS PACKAGE ONLY

To add a Select/Sort:

1. From the Report menu in the Control Window, choose Options.
   The Report Options dialog box appears.
2. In the Select/Sort group box, choose Add.
   The Add Select/Sort dialog box appears.
3. Enter the name of the new Select/Sort in the Select/Sort Name edit box.
4. Make entries in the SQL Expression edit box as desired.
5. When finished with the Add Select/Sort dialog box, choose OK.
6. When finished with the Report Options dialog box, choose Close.

Modifying a Select/Sort

PLUS PACKAGE ONLY

To modify a Select/Sort:

1. From the Report menu in the Control Window, choose Options.
   The Report Options dialog box appears.
2. In the Select/Sort group box, choose Modify.
   The Modify Select/Sort dialog box appears.
3. Make the desired changes.
4. When finished with the Modify Select/Sort dialog box, choose OK.
5. When finished with the Report Options dialog box, choose Close.

Copyright 2008 SRMi Consulting, LLC

Deleting a Select/Sort

PLUS PACKAGE ONLY

Factory-defined Select/Sorts cannot be deleted.

To delete a custom Select/Sort:

1. From the Report menu in the Control Window, choose Options.
   The Report Options dialog box appears.
2. Choose the custom Select/Sort you wish to delete in the Select/Sort list.
3. Choose the Delete push button.
   The Delete Select/Sort dialog box appears.
4. Choose yes to delete the Select/Sort.
5. When finished with the Report Options dialog box, choose Close.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

SQL Syntax Functions

SQL Syntax Functions

If you add a Select/Sort you will need to know Structured Query Language (SQL). We have added three functions to SQL, the ASK() function, the ASKEX() function, and the ASKSYS() function, which are described in the following sections.

The ASK() Function

PLUS PACKAGE ONLY

ASK(Prompt, Size, Type, Default, VariableName)

The ASK() function directs SQL to query the user at the time the report is created for a value to return which is used to replace the ASK() function in the expression. The ASK() function uses the commas as field delimiters; therefore, using commas in *prompt* or *default* parameters is illegal.

The first parameter, Prompt, is a character string that is displayed when the user is asked to enter a value at run time. A example of a valid prompt is 'Enter the department name'. However, do not enclose the prompt in quotes unless you want them to appear in the prompt to the user.

Size specifies the maximum number of characters for the input. The user's input will be limited to the maximum size specified by this parameter.

The available Types are CHAR (character), NUMBER, and DATE. If no Type specified, CHAR will be used.

Default is a constant of type Type that provides the default value for substitution. This value must be legal for substituting in the expression. If the Type is a NUMBER, no quotes are required. If the Type is a CHAR or DATE, the Default must be specified with quotes. For instance, for the Type DATE, one would place quotes around TODAY: 'TODAY'.

As an example, a default constant for a type DATE might be '20050105', representing January 5th, 2005. A special example for type DATE is TODAY, which returns the system date.

VariableName is used to identify the response to the ASK in the .ini file.

The ASKSYS() Function

PLUS PACKAGE ONLY

ASKSYS(Fieldname)

The ASKSYS() function returns information about the currently selected subject record. The parameter Fieldname may be COMPANY, COMPANYNM,

Copyright 2008 SRMi Consulting, LLC

CURCOMPANY, LASTNAME, FIRSTNAME, SUBJECTID, TESTDATE, and TESTTIME.

There are two company-related ASKSYS functions: ASKSYS(COMPANY) and ASKSYS(CURCOMPANY).

To join tables on Company ID in the current tables only, use ASKSYS(CURCOMPANY). For an example of using only ASKSYS(CURCOMPANY), review the "Current Subject" factory-defined Select/Sort in the "Subject Test" report template.

To join tables on Company ID in the non-current tables only, use ASKSYS(COMPANY). For an example of using only ASKSYS(COMPANY), review the "Current Company" factory-defined Select/Sort for any report template.

To join tables on Company ID in both the current and the non-current tables, use both ASKSYS(CURCOMPANY) and ASKSYS(COMPANY). For an example of using both ASKSYS functions, review the "Current Subject" factory-defined Select/Sort in the "Notification Letter" report template.

The "current tables" are used only to store temporary information about the so-called "current subject" and/or "current test" for printing reports, whose identities depend on what you are doing in the program at any given time. These tables are written to and then erased for each print job. The "Current Subject" factory-defined Select/Sorts (only) were designed for printing reports based on the "current subject" and/or "current test" at any given time. If you are writing your own SQL, you don't need to refer to the current tables or to ASKSYS(CURCOMPANY) unless you want your report's data to include the "current subject" and/or "current test."

The ASKEX() Function

The ASKEX() function is described in this section. Its name comes from the fact that it is an extended ASK function.

ASKEX(Group TableName FieldName [Prompt] [VarName1] [VarName2] [VarName3]

[#A [Type] [Size]]

[#F [Range] [ListDatabase] [Blanks] [LockList]]

[#I [InitVal1] [InitVal2] [InitVal3]]

[#D [DispVal1 DatabaseVal1] … [DispValN DatabaseValN]])

Main Section (mandatory section; parameters are positional)

1. **Group** – OR Grouping
    - 1 – AND row with previous row; *default value*
    - 0 – OR with previous row; any number of rows can be grouped together
2. **TableName** – SQL table name; name is validated against database

Copyright 2008 SRMi Consulting, LLC

- *No Default*

3. **FieldName** – SQL field name; name is validated against fields in database table
   - *No Default*
4. **Prompt** – field prompt name to display in selection criteria dialog; there are several special codes
   - *Default is Field Name:*
   - USRDEF**n** – uses prompt from UDFld.Prompt based on the current company
     - If there is no UDFld.Prompt value, the user define is not displayed
     - Reads values from UD table to automatically populate combo box.
   - SUBJECTID – uses prompt from company table
5. **VarName1** – variable name assigned to first control; names and values are written to .ini in form:
   - **RPTVARNAMEnn=VarName1**
   - **RPTVARnn**=”control 1 value”
   - *Default* is “”
6. **VarName2** – variable name assigned to second control
   - *Default* is “”
7. **VarName3** – variable name assigned to third control
   - *Default* is “”

#A – Attributes Section (optional section, must precede section #F, parameters can be in any order)

8. **Type** – type of field
   - *Defaults to field type from database*
   - CHAR – any alpha numeric character
   - DATE – mm/dd/yyyy
   - NUMBER, NUM, or NBR – any numeric character
   - LANG – language
   - MEMO – variable length character field; can only use LIKE command
9. **Size** – length of field; default is 10 for DATE and 20 for CHAR
   - *Defaults to length from database*
   - MAX – use maximum field size
   - 1 to MAX – length of field up to a MAX of 40

#F – Flags Section (optional section, must precede section #D) – flags can be in any order; only 1 flag per flag group

10. **Range** – range indicator; range is depicted with TO on selection criteria dialog
    - NR – not a range; *default value*

Copyright 2008 SRMi Consulting, LLC

- R – display two controls; one for start and one for end; automatically make Edit or Combo
- RC – use Combo Box or Edit control; *default value for **Type**s except DATE*
- RE – use only Edit control, allows to always freeform value; *default value for **Type** DATE*

11. **ListDatabase** – show database values in combo box dropdown lists
    - ND – do not read database when first displaying dialog; *default value for all **Type**s except Lang and companyid fields*
    - D – Read database to get actual values (database reads can take a few seconds) ; *default value for **Type** Lang and all companyid fields*

12. Blanks

- NB – do not allow to select blank values; typically used if blank values are not allowed, e.g. Status; *default value for Type Number and Lang and companyid fields*
- B – allow to select blank values; *default value except for **Type** Number and Lang and companyid fields*

13. LockList

- NL – values are not limited to list; means an Edit control is needed; *default value*
- L – values are limited to list; means a Combo Box can be used

14. Mandatory

- NM – no entries are required for the row; *default value*
- M – an entry for the row is required

15. And

- NA – do not AND the row; used if an AND with the first condition causes the SQL to fail
- A – AND the row; *default value*

16. **SQLLike** – use SQL LIKE command for comparisons (see the description of the SQL LIKE at the end of this section)
    - NSL – do not use SQL LIKE operator; *default value except for **Type** MEMO;* not allowed for **Type** MEMO
    - SL – use SQL LIKE operator; *default value for **Type** MEMO*

#I – Initial Values Section (optional section, parameters are positional)

17. **InitVal1** – initial value for first control
    - *Default* is previous value used for this field
    - See Keyword list
    - **I**nitial start value for RANGE

Copyright 2008 SRMi Consulting, LLC

18. **InitVal2** – initial value for second control
    - *Default* is previous value used for this field
    - See Keyword list
    - **I**nitial end value for RANGE
19. **InitVal3** – initial value for third control
    - *Default* is previous value used for this field
    - See Keyword list

#D – Display Values Section (optional section) - Display and DB values grouped together any number of times

20. **DispVal1..N** – combo box display value, e.g. Yes or No
21. **DatabaseVal1..N** – database value that represents display value, e.g. Yes may represent a 1 on the database; *defaults to **DispVal1..N***

Keywords for Values

1. TODAY – today's date
2. [today] – current date; does not actually show the date
3. [current subject] – current subject; does not actually show the subject id
4. [current company] –current company; does not actually show the company id
5. [blank values] – match records with blank values for **FieldName**
6. [nonblank values] – match records with nonblank values for **FieldName**

Notes:

1. Only the Main Section is required.
2. Parameter delimiters: space, comma, horizontal tab, LF or CR.
3. Maximum of 20 selection criteria rows.
4. One conditional clause is allowed. Clause starting delimiter #CS, clause ending delimiter #CE. A clause is automatically removed if there are no values for any of the ASKEXs within the clause.
5. ASK is fully functional.
6. Queries can span entire database.
7. Blank lines are automatically deleted from generated SQL to make it more readable.
8. Upper and lower case does not matter except for special Prompt values.

Copyright 2008 SRMi Consulting, LLC

9. Count Records button only works if SQL starts with ‘select *’.
10. Combo boxes are limited to 500 entries.

SQL LIKE

The LIKE command is used to specify a search for a pattern. Use a "%" sign to define wildcards both before and after the pattern. For instance, if you are querying the database for subjects with last names beginning with "P", you would include "LIKE 'P%'" in the SQL statement. In another example, you would search for the element "head" in a subject's last name by including "LIKE '%head%'" in the SQL statement.

Copyright 2008 SRMi Consulting, LLC

Backup and Restore

Backing Up Records: An Overview

The Backup function is available only if the Database Interface in Setup is set for Storage.

To see the Backup dialog box:

1. From the File menu in the Control Window, choose Backup.

IF YOU DO NOT HAVE THE PLUS PACKAGE:

The backup function backs up data on the company, all subjects, and all audiograms.

The File (*.mdb) edit box is for the location and name of the file that will contain the backup. Enter the location and name of the file database in this edit box, or you can browse for the file using the Browse push button. You can create the file at the time of backup, or use an existing file. If you are using an existing file, any data that is currently in the file will be overwritten upon backup.

The default backup file and location are d:\stx.mdb.

If the 'Write log file' check box is selected, a log file will be created that you can check later for information. The Log File edit box is for the location and name of the log file. You can change the location and name from the default ones if you wish, or browse for the file using the Browse button.

IF YOU HAVE THE PLUS PACKAGE:

Using the Backup dialog box, you can back up data on all companies, subjects, audiograms, import/export formats, export filters, and Notification Letter preferences (including user-defined fields). You may back up data to either a file database or an SQL database. You can create the file or SQL database upon backup, or use an existing database. If you are using an existing database, any data that is currently in it will be overwritten upon backup. The same security measures are in force as for the initial log-in to the system.

The Database Type group box shows two choices: File database and SQL database.

The File (*.mdb) edit box is used if you are backing up to a file database. Enter the name of the file database in this edit box, or you can browse for the file using the Browse push button. The default backup file and location are d:\stx.mdb.

The Server and Database edit boxes are used if you are backing up to a SQL database. The default server and database, respectively, are BMIMSDEServer and STXBAK. If you need to change servers, you may enter the server name in the Server edit box, or browse for it using the Browse push button. If you are already on the right server, you may enter the database name, or browse for it using the Browse push button.

Copyright 2008 SRMi Consulting, LLC

If the 'Write log file' check box is selected, a log file will be created that you can check later for information. The Log File edit box is for the location and name of the log file. You can change the location and name from the default ones if you wish, or browse for the file using the Browse button.

Backing Up Records

IF YOU DO NOT HAVE THE PLUS PACKAGE:

To back up data:

1. In the Control Window, choose Backup from the File menu.
   The Backup dialog box appears.
2. In the File (*.mdb) edit box, enter the name of the file database to which you are backing up data, or choose the Browse push button to find the file.
3. Choose whether to create a log file using the 'Write log file' check box.
   If desired, you can change the default location and name of the log file in the Log File edit box, or browse for the file using the Browse button.
4. Choose OK.

IF YOU HAVE THE PLUS PACKAGE:

To back up data:

1. In the Control Window, choose Backup from the File menu.
   The Backup dialog box appears.
2. In the Database Type group box, choose File database or SQL database.
   If you plan to use the default option(s), skip to step 4.
3. Depending on whether you chose a file or SQL database, either enter the file database name in the File (*.mdb) edit box, or enter the Server and Database names in the Server and Database edit boxes, respectively. Alternatively, you may use the Browse push button(s).
4. Choose whether to create a log file using the 'Write log file' check box.
   If desired, you can change the default location and name of the log file in the Log File edit box, or browse for the file using the Browse button.
5. Choose OK.

Restoring Records: An Overview

The Restore function is available only if the Database Interface in Setup is set for Storage.

IF YOU DO NOT HAVE THE PLUS PACKAGE:

The Restore dialog box enables you to restore data from a file database. The same security measures are in force as for the initial log-in to the system.

Copyright 2008 SRMi Consulting, LLC

The File (*.mdb) edit box is for the name of the file database to be restored. Alternatively, you can browse for the file using the Browse push button. The default file database and location are d:\stx.mdb.

If the 'Write log file' check box is selected, a log file will be created that you can check later for information. The Log File edit box is for the location and name of the log file. You can change the location and name from the default ones if you wish, or browse for the file using the Browse button.

To see the Restore dialog box:

1. Choose Restore from the File menu in the Control Window.

PLUS PACKAGE ONLY

The Restore dialog box enables you to restore data from either a file database or a SQL database. The same security measures are in force as for the initial log-in to the system.

The Database Type group box shows two choices: File database and SQL database.

The File (*.mdb) edit box is used if you are restoring a file database. Enter the name of the file database in this edit box, or you can browse for the file using the Browse push button. The default file database and location are d:\stx.mdb.

The Server and Database edit boxes are used if you are restoring a SQL database. If you need to change servers, you may enter the server name in the Server edit box, or browse for it using the Browse push button. If you are already on the right server, you may enter the database name, or browse for it using the Browse push button.

If the 'Write log file' check box is selected, a log file will be created that you can check later for information. The Log File edit box is for the location and name of the log file. You can change the location and name from the default ones if you wish, or browse for the file using the Browse button.

To see the Restore dialog box:

1. Choose Restore from the File menu in the Control Window.

Restoring Records

IF YOU DO NOT HAVE THE PLUS PACKAGE:

To restore data from the backed-up file:

1. In the Control Window, choose Restore from the File menu.
   The Restore dialog box appears.
2. In the File (*.mdb) edit box, enter the name of the file database from which you are restoring data, or choose the Browse push button to find the file.

Copyright 2008 SRMi Consulting, LLC

3. Choose whether to create a log file using the 'Write log file' check box.
   If desired, you can change the default location and name of the log file in the Log File edit box, or browse for the file using the Browse button.
4. Choose OK.

IF YOU HAVE THE PLUS PACKAGE:

To restore data from the backed-up file:

1. In the Control Window, choose Restore from the File menu.
   The Restore dialog box appears.
2. In the Database Type group box, choose File database or SQL database.
3. Depending on whether you chose a file or SQL database, either enter the file database name in the File (*.mdb) edit box, or enter the Server and Database names in the Server and Database edit boxes, respectively. Alternatively, you may use the Browse push button(s).
4. Choose whether to create a log file using the 'Write log file' check box.
   If desired, you can change the default location and name of the log file in the Log File edit box, or browse for the file using the Browse button.
5. Choose OK.

Copyright 2008 SRMi Consulting, LLC

Extract and Merge

Extracting Records: An Overview

PLUS PACKAGE ONLY

The Extract function is available only if the Database Interface in Setup is set for Storage. This function is intended for data transfer and synchronization between two Benson Medical Instruments products.

The extract function makes a copy of a subset of the database and saves it to a specified file or SQL database. You can create the file or database at the time of the Extract, or use an existing file. If you are using an existing file or database, any data that is currently in the file or database will be overwritten upon Extract. During an extract, records are only copied, not removed from the existing database; all the original records are still there when the extract is finished.

You can choose the type of data you want to make a copy of. Subject demographic, audiogram, and history data may be extracted for more than one company at a time. Factory-defined Extract Configurations are available, or you can create your own configurations. You will need to use SQL when entering the filter expression. A log file may be created with details of the Extract operation.

Extract Dialog Box

PLUS PACKAGE ONLY

In the Extract dialog box, the Database Type group box shows two choices: File database and SQL database.

The File (*.mdb) edit box is used if you are extracting to a file database. Enter the name of the file database in this edit box, or you can browse for the file using the Browse push button. The default backup file and location are d:\stxextract.mdb.

The Server and Database edit boxes are used if you are extracting to a SQL database. The default server and database, respectively, are BMIMSDEServer and STXEXTRACT. If you need to change servers, you may enter the server name in the Server edit box, or browse for it using the Browse push button. If you are already on the right server, you may enter the database name, or browse for it using the Browse push button.

The Configuration combo box allows you to choose the type of data that you will extract (make a copy of).

If the ‘Create log file’ check box is selected, a log file will be created of the Extract that you can check later for information. The name and location of the log file are set in the Log File edit box. You may browse for the file using the Browse button. If the indicated file already exists, it is overwritten without prompting.

Copyright 2008 SRMi Consulting, LLC

To see the Extract dialog box:

1. Choose Extract from the File menu.

Extracting Records

PLUS PACKAGE ONLY

To extract (make a copy of) records from the database:

1. Choose Extract from the File menu in the Control Window.
   The Extract dialog box appears.
2. In the Database Type group box, choose File database or SQL database.
3. Depending on whether you chose a file or SQL database, either enter the name of the file that will contain the extracted data in the File (*.mdb) edit box, or enter the server and database names in the Server and Database edit boxes, respectively. Alternatively, you may use the Browse push button(s).
4. If you wish to create a log file, select the 'Write log file' check box.
5. If desired, change the name and location of the log file from the default entry in the Log File edit box.
   If the file exists, it will be overwritten without prompting. Alternatively, you may use the Browse push button to find the file.
6. Choose the Extract Configuration using the Config combo box.
7. Choose OK.
   The extract will proceed automatically.

Extract Configurations

PLUS PACKAGE ONLY

The software includes a number of pre-defined Extract Configurations. You may also choose to create your own Extract Configuration. Users must have administrator access to add, modify, delete, or duplicate Extract Configurations. User-defined Extract Configurations will appear in the Configuration combo box in the Extract dialog box.

Pre-Defined Extract Configurations

PLUS PACKAGE ONLY

Pre-defined Extract Configurations are used to create a copy of commonly used groups of records. These configurations are described in the table below.

Copyright 2008 SRMi Consulting, LLC

Extract Configurations	Description
All	all database records
Current Company	all records from the current company
Subjects/Audiograms/History in date range	all subjects, audiograms, and medical histories within a certain date range (can be from different companies)
Current Co. Subjects/Audiograms/History in date range	all subjects, audiograms, and medical histories in the current company within a certain date range
Daily Calibration	daily calibration data
Daily Calibration in date range	daily calibration data in a date range
Utility Record Groups	reports, export filters, import/export formats, and extract/merge configurations

Custom Extract Configurations

PLUS PACKAGE ONLY

You may also create custom Extract Configurations. It may be easier to duplicate an existing configuration and modify that, rather than adding one.

Databases comprise a set of tables, each of which hold certain types of data. For example, the Subject table holds the subject demographic data. The Add Extract Configuration dialog box allows you to choose which tables to include in the Extract. Selecting the check box in the Extract column will include the contents of that table in the Extract Configuration.

It is often useful to choose only a subset of data from a given table. The Filter buttons allow you to add a SQL expression that chooses the records from each table that will be included in the Extract.

Relational databases follow a hierarchy of tables. For example, in this database every audiogram must be associated with a particular subject. Therefore, the Subject table must be included when the Audiogram table is included. This happens automatically in the Add Extract Configuration dialog box.

The Check SQL button in the Extract Configurations dialog box will cause the audiometer software to examine the SQL expressions for errors. If the SQL expressions contain one or more errors, an error message will be displayed that

Copyright 2008 SRMi Consulting, LLC

shows the error(s) found. The Check SQL button will also show the dialog boxes that will ask for ranges, if the configuration involves ranges.

Refer to Database Field Definitions for table names and field names, and to SQL Syntax Functions for information on the SQL syntax functions that have been included. A relational diagram of the Extract/Merge record groups can be found in Extract/Merge Record Groups: A Diagram.

Adding an Extract Configuration

PLUS PACKAGE ONLY

To add an Extract configuration:

1. From the File menu in the Control Window, choose Extract Configurations.
   The Extract Configurations dialog box appears.
2. Choose the Add push button.
   The Add Extract Configuration dialog box appears.
3. Enter the name of the new configuration in the Name edit box.
4. For each record group, unselect the Extract check box if you do not wish to extract it.
5. Apply a filter to each record group as desired.
   To apply a filter, choose the Filter button by that record group: the 'Modify … Filter' dialog box will appear. Enter the SQL expression. Choose the Check SQL button to check the expression and/or see any 'ASK' dialog boxes that will appear. When finished with the 'Modify … Filter' dialog box, choose OK.
6. Choose the Check SQL push button as desired.
7. When finished with the Add Extract Configuration dialog box, choose OK.
   The new configuration will appear in the list in the Extract Configurations dialog box.
8. In the Extract Configurations dialog box, choose Close.

Modifying an Extract Configuration

PLUS PACKAGE ONLY

Only user-defined Extract Configurations may be modified.

To modify an Extract configuration:

1. From the File menu in the Control Window, choose Extract Configurations.
   The Extract Configurations dialog box appears.
2. Select the configuration in the list.
3. Choose the Modify push button.
   The Modify Extract Configuration dialog box appears.

Copyright 2008 SRMi Consulting, LLC

4. Make changes as desired.
5. When finished with the Modify Extract Configuration dialog box, choose OK.
6. In the Extract Configurations dialog box, choose Close.

Deleting an Extract Configuration

PLUS PACKAGE ONLY

Only user-defined Extract Configurations may be deleted.

To delete an Extract configuration:

1. From the File menu in the Control Window, choose Extract Configurations.
   The Extract Configurations dialog box appears.
2. Select the configuration in the list.
3. Choose the Delete push button.
   The Delete Configuration dialog box appears.
4. Choose Yes to delete the configuration.
5. In the Extract Configurations dialog box, choose Close.

Duplicating an Extract Configuration

PLUS PACKAGE ONLY

Duplicating Extract configurations saves time when you are creating your own configurations, because you are starting with an existing configuration. Duplicate a factory-defined configuration in order to modify it.

To duplicate an Extract configuration:

1. From the File menu in the Control Window, choose Extract Configurations.
   The Extract Configurations dialog box appears.
2. In the list, choose the configuration that you wish to duplicate.
3. Choose the Duplicate push button.
   The duplicate configuration will appear in the list. The name will be "Copy of (name)."
4. Choose Close.

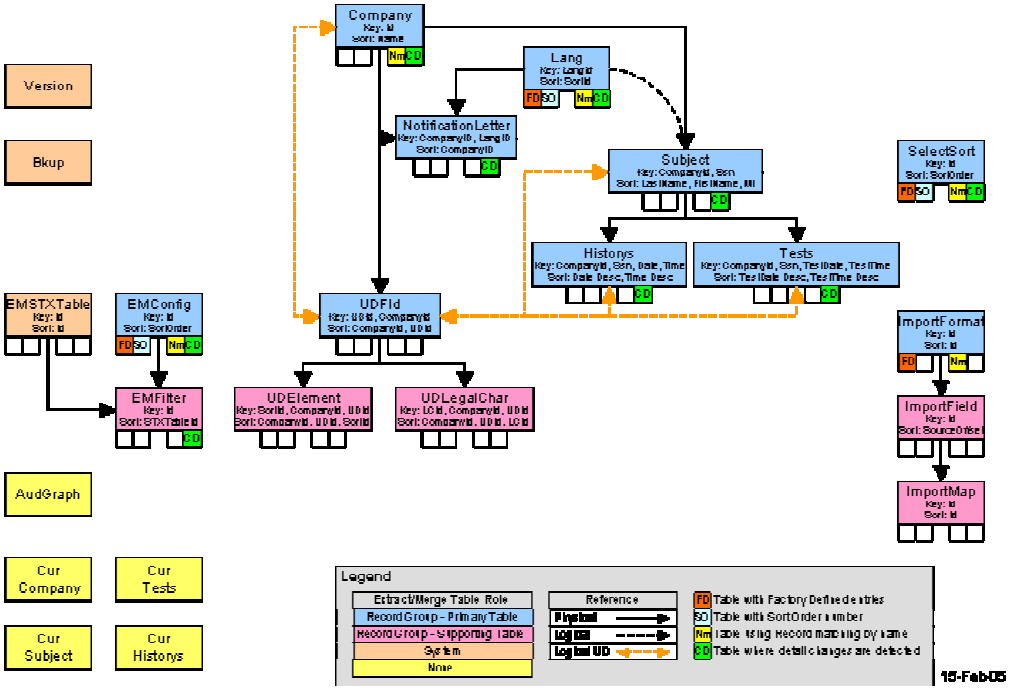
Extract/Merge Record Groups: A Diagram

PLUS PACKAGE ONLY

Below is a diagram of the Extract/Merge record groups.

Copyright 2008 SRMi Consulting, LLC

Extract / Merge "Record Groups" – STX 5.0 DB Diagram



Merging Records: An Overview

PLUS PACKAGE ONLY

The Merge function is available only if the Database Interface in Setup is set for Storage. This function is intended for data transfer and synchronization between two Benson Medical Instruments products. Merge imports records that have been extracted from another Benson Medical Instruments product and merges them with the existing records. Before merging records into the database, it is good practice to back up your data files. If the file you are merging from is corrupted or an accidental interruption of the computer occurs, the data files may be harmed.

The data to be merged may be in another database on a server, or in a file created by Extract or Backup.

You can choose the type of data you want to merge into the database. Subject demographic, audiogram, and history data may be merged for more than one company at a time. Factory-defined Merge Configurations are available, or you can create your own configurations. You will need to use SQL when entering the filter expression. A log file may be created with details of the Merge operation.

Subject demographic, audiogram, and history data may be merged for more than one company at a time. Companies are matched at Merge time by an exact match of the Company Name field. That is, if the Company Name field in the data to be merged exactly matches the corresponding field in the database to be merged into,

Copyright 2008 SRMi Consulting, LLC

the data is merged into that company. If there is no exact match, a new company is created. In the case where more than one company is an exact match, an error is displayed.

Since merging data into the database carries the risk of overwriting data that is needed, the Trial Merge feature enables you to determine the effects of merging. If a Merge action is carried out with this check box selected, no data will actually be merged into the database, but a log file is created. After the trial merge is complete, you can check the log file for information on what would have resulted if this had been an actual merge.

Merge Dialog Box

PLUS PACKAGE ONLY

In the Merge dialog box, the Database Type group box specifies either a file database or a database on a server.

If 'File database' is chosen, the File edit box is available. The File edit box is for the name of the file containing the records that will be merged into the database. The default file and path are c:\sample.mdb; choose the Browse button to browse for a different file.

If 'SQL database' is chosen, the Server and Database edit boxes are available. If your database is located in a place other than the default location, enter the server and database names, or use the Browse buttons to browse for the server and database.

The Configuration combo box allows you to choose the type of data that you will merge into the database.

The Trial Merge check box enables you to determine the effects of an actual merge by checking the log file.

If the 'Create log file' check box is selected, a log file will be created. The Log File edit box is for the location and file name of the log file. You may browse for the file using the Browse button.

To see the Merge dialog box:

1. Choose Merge from the File menu.

Merging Records: Procedure

PLUS PACKAGE ONLY

To merge records into the database:

1. Choose Merge from the File menu in the Control Window.
   The Merge dialog box appears.
2. In the Database Type group box, choose File database or SQL database.

Copyright 2008 SRMi Consulting, LLC

3. Depending on whether you chose a file or SQL database, either enter the name of the file containing the data to be merged in the File (*.mdb) edit box, or enter the server and database names in the Server and Database edit boxes, respectively.
   Alternatively, you may use the Browse push button(s).
4. If you wish to create a log file, select the 'Write log file' check box.
5. If desired, change the name and location of the log file from the default entry in the Log File edit box.
   If the file exists, it will be overwritten without prompting. Alternatively, you may use the Browse push button to find the file.
6. Choose the Merge Configuration using the Config combo box.
7. Choose OK.
   The merge will proceed automatically.

Merge Configurations

PLUS PACKAGE ONLY

Merge configurations specify which data should be merged into the database. You may either choose one of a number of pre-defined Merge configurations, or create your own. Users must have administrator access to add, modify, delete, or duplicate Merge Configurations.

To see the Merge Configurations dialog box:

1. From the File menu in the Control Window, choose Merge Configurations.

Pre-Defined Merge Configurations

PLUS PACKAGE ONLY

Pre-defined Merge Configurations can be seen in the Merge Configurations dialog box (to see this dialog box, choose Merge Configurations from the File menu in the Control Window). Factory-defined Merge configurations cannot be changed.

Merge Configurations	Description
All	all database records
Current Company	all records from the current company
Subjects/Audiograms/History in date range	all subjects, audiograms, and medical histories within a certain date range (can be from different companies)
Current Co. Subjects/Audiograms/History in date range	all subjects, audiograms, and medical histories in

Copyright 2008 SRMi Consulting, LLC

	the current company within a certain date range
Daily Calibration	daily calibration data
Daily Calibration in date range	daily calibration data in a date range
Utility Record Groups	reports, export filters, import/export formats, and extract/merge configurations

Custom Merge Configurations

PLUS PACKAGE ONLY

You may also create custom Merge Configurations. It may be easier to duplicate an existing configuration and modify that, rather than adding one.

Databases comprise a set of tables, each of which hold certain types of data. For example, the Subject table holds the subject demographic data. The Add Merge Configuration dialog box allows you to choose which tables to include in the Merge. Selecting the check box in the Extract column will include the contents of that table in the Extract Configuration.

Relational databases follow a hierarchy of tables. For example, in this database every audiogram must be associated with a particular subject. Therefore, the Subject table must be included when the Audiogram table is included. This happens automatically in the Add Extract Configuration dialog box.

The Add column and the Update column each have a check box for each record group. When ‘Add’ is selected for a record group, new records will be added in that category (for instance, new audiograms in the Audiogram record group). If ‘Update’ is selected for a record group, any new data will overwrite previous data in that category for that record group (for instance, a new address for a company will overwrite the old address in the Company record group).

In an example of how the Add and Update columns might be used, suppose that a subject that already exists in the database has been recently tested in the field, so there is an additional audiogram for that person that needs to be merged into the home database. The home office would like to get the new audiogram, but wants to keep control of all demographic data on people being tested, to avoid inaccuracies being introduced into the database. The Merge Configuration would then be set to "Add" but not "Update" subjects, with both "Add" and "Update" being checked for audiograms and histories. With these conditions, the new test would be added for the subject, but the person’s demographic data would remain unchanged even if his or her address, etc., had been entered at the testing site. If any new subjects came to the testing site, however, they and their demographic information would be added during the Merge, along with their tests.

Copyright 2008 SRMi Consulting, LLC

It is often useful to choose to merge only a subset of data from a given table. The Filter buttons allow you to add a SQL expression that choose the records from each table that will be included in the merge. The Filter buttons at right, when clicked, show a 'Modify … Filter' dialog that contains the entire SQL expression for each filter.

The Check SQL button in the Merge Configurations dialog box will cause the audiometer software to examine the SQL expressions for errors. If the SQL expressions contain one or more errors, an error message will be displayed that shows the error(s) found. The Check SQL button will also show the dialog boxes that will ask for ranges, if the configuration involves ranges.

Refer to Database Field Definitions for table names and field names, and to SQL Syntax Functions for information on the SQL syntax functions that have been included. A relational diagram of the Extract/Merge record groups can be found in Extract/Merge Record Groups: A Diagram.

Adding a Merge Configuration

PLUS PACKAGE ONLY

To add a Merge configuration:

1. From the File menu in the Control Window, choose Merge Configurations.
   The Merge Configurations dialog box appears.
2. Choose the Add push button.
   The Add Merge Configuration dialog box appears.
3. Enter the name of the new configuration in the Name edit box.
4. For each record group, unselect the Add check box if you do not wish to add it.
5. For each record group, unselect the Update check box if you do not wish to update it.
6. Apply a filter to each record group as desired.
   To apply a filter, choose the Filter button by that record group: the 'Modify … Filter' dialog box will appear. Enter the SQL expression. Choose the Check SQL button to check the expression and/or see any 'ASK' dialog boxes that will appear. When finished with the 'Modify … Filter' dialog box, choose OK.
7. Choose the Check SQL push button as desired.
8. When finished with the Add Merge Configuration dialog box, choose OK.
   The new configuration will appear in the list in the Merge Configurations dialog box.
9. In the Merge Configurations dialog box, choose Close.

Copyright 2008 SRMi Consulting, LLC

Modifying a Merge Configuration

PLUS PACKAGE ONLY

To modify a Merge configuration:

1. From the File menu in the Control Window, choose Merge Configurations.
   The Merge Configurations dialog box appears.
2. Select the configuration in the list.
3. Choose the Modify push button.
   The Modify Merge Configuration dialog box appears.
4. Make changes as desired.
5. When finished with the Modify Merge Configuration dialog box, choose OK.
6. In the Merge Configurations dialog box, choose Close.

Deleting a Merge Configuration

PLUS PACKAGE ONLY

To delete a Merge configuration:

1. From the File menu in the Control Window, choose Merge Configurations.
   The Merge Configurations dialog box appears.
2. Select the configuration in the list.
3. Choose the Delete push button.
   The Delete Configuration dialog box appears.
4. Choose Yes to delete the configuration.
5. In the Merge Configurations dialog box, choose Close.

Duplicating a Merge Configuration

PLUS PACKAGE ONLY

To duplicate a Merge configuration:

1. From the File menu in the Control Window, choose Merge Configurations.
   The Merge Configurations dialog box appears.
2. In the list, choose the configuration that you wish to duplicate.
3. Choose the Duplicate push button.
   The duplicate configuration will appear in the list.
4. Choose Close.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Import and Export

Import Overview

PLUS PACKAGE ONLY

The Import function is available only if the Database Interface in Setup is set for Storage.

This database has several requirements for importing data. Hereafter we will refer to records and fields exported from another database as ASCII records and ASCII fields. The fields and records that these data are mapped to in this database will be referred to as database records and database fields.

In order to be imported into the database, the ASCII records must meet these conditions:

➢If your import format contains one or more delimited fields, there must be a delimiting character or characters for each of these fields.

➢Each record must contain a Subject ID that conforms to the Subject ID format that is currently chosen for the company.

➢In a given company, no two subjects should have the same Subject ID, or each subsequent subject record with the same Subject ID will overwrite the previous one.

➢In a given company, no two tests for the same subject may have the same date and time, or the previous will be overwritten, as above.

➢A test must have a time. If it does not have a time, it will not be imported.

The ASCII fields defined in the format will overwrite the corresponding database fields. Therefore, when preparing to import data, include field definitions in your import format only for the fields that you want to overwrite.

You can import only into the current company.

While importation is in progress, the database checks certain types of imported data for validity. You have two options for handling data validation errors on import: see Validation of Imported Data.

Before importing records into the database, it is good practice to back up your data files. If the file you are importing from is corrupted or an accidental interruption of the computer occurs, the data files may be harmed.

IMPORT DIALOG BOX

In the Import dialog box, the File edit box is for the name of the file to be imported. The Format combo box lists available formats. The check box ‘Write data validation errors to log file’ enables you to write these errors to a file instead of having the data importation interrupted. If you check this option, you may change the default path in the Log File edit box.

Copyright 2008 SRMi Consulting, LLC

To see the Import dialog box:

1. From the File menu in the Control Window, choose Import.

Validation of Imported Data

PLUS PACKAGE ONLY

Each standard format includes validation of dates, times, threshold values, and Subject IDs. Subject IDs in the data being imported must be in accordance with the current Subject ID format settings for the company. If the database finds an illegal or missing Subject ID, or an illegal date, time, or threshold, there will be a data validation error. You have two options for data validation errors on import: they can appear on the screen as they occur, or they can be logged to a file for viewing later. If you choose to see errors on the screen as they occur, data importation will be interrupted in each instance, and an error message will appear. Choosing OK in the error message allows importation to resume. Thus, someone must be present to monitor data import. The other option involves errors being logged to a file, and in this case, no one would have to be present to handle data validation error messages during import.

Importing Data

PLUS PACKAGE ONLY

To import data into the database:

1. Select the File menu from the Control Window and choose Import.
   The Import dialog box appears.
2. Enter the name of the file to be imported, or find the file using the Browse push button.
3. Choose the format from the Format combo box.
4. If you wish to create a log file showing data validation errors, select the 'Write data validation errors to log file' check box.
5. If desired, change the name and location of the log file from the default entry in the Log File edit box.
   If the file exists, it will be overwritten without prompting. Alternatively, you may use the Browse push button to find the file.
6. Choose the Import push button.
   The import will proceed automatically.

Copyright 2008 SRMi Consulting, LLC

Export Overview

PLUS PACKAGE ONLY

The Export function is available only if the Database Interface in Setup is set for Storage.

You can export audiograms and subject data from this database for import into other databases. You may export only from the current company.

The File edit box is for the location and name of the file that will contain the exported data. You can create the file at the time of export, or you can enter the location and name of an existing file. If you are using an existing file, any data that is currently in the file will be overwritten upon export. The Browse button enables you to find the file.

The Format combo box is for the export format. If the export format requires any audiogram data, a subject who does not have an audiogram will not be exported. But if you are exporting only subject data, all subjects will be exported. You may choose a predefined format or create your own. For information on formats, see Formats for Importing and Exporting.

The Filter combo box is for the export filter. For information on export filters, see Export Filters .

Exporting Data

PLUS PACKAGE ONLY

To export data from the database:

1. Select the File menu from the Control Window and choose Export.
   The Export dialog box appears.
2. Enter the location and name of the file that will contain the exported data, or find the file using the Browse button.
3. Choose the format from the Format combo box.
4. Choose the filter from the Filter combo box.
5. Choose the Export push button.
   The export will proceed automatically.

Functions Performed during Import/Export

PLUS PACKAGE ONLY

Features such as field mapping, re-formatting, export-only fields, and trimming leading or trailing spaces enable you to deal with special circumstances of import or export. See the following sections for more information.

Copyright 2008 SRMi Consulting, LLC

For import, the database performs several functions as desired. These are performed in the following order:

1. trim leading and/or trailing spaces
2. formatting for import
3. field mapping

For export, the database performs several functions as desired. These are performed in the following order:

1. field mapping
2. import/export formatting

Database Field Definitions

PLUS PACKAGE ONLY

The table below show the database field definitions.

Description	Field	Size	Type
Company Name	Company -> Name	40	Text
Company Address line 1	Company -> Addr1	20	Text
Company Address line 2	Company -> Addr2	20	Text
Company City	Company -> City	20	Text
Company State	Company -> State	2	Text
Company Zip Code	Company -> Zip	9	Text
Company Country	Company -> Country	20	Text
Company Phone	Company -> Phone	10	Text
Company Contact	Company -> Contact	20	Text
Company Comment	Company -> Comment	4000	Text
Company STS Age Correction	Company -> STSCorr	1	Number 1-Use Age Correction 0-No Age Correction
Company Automatic Baseline Revision	Company -> BaseRevAuto	1	Number 1-Use Auto Revision 0-No Auto Revision
Company Separate Left/Right Baselines	Company -> SeparateBase	1	Number 1-Use Separate Base 0-Don’t Use Separate Base
Company Baseline Revision Criteria	Company -> BaseRevCriteria	1	Number 0-NHCA

Copyright 2008 SRMi Consulting, LLC

Company Retest Period	Company -> RetestPeriod	5	Number of days
Company NR Substitution	Company -> NRSubstitution	5	Number
Company Regulation Type	Company -> RegulationType	1	Number 0-OSHA 1-MSHA
Subject ID	Subject -> SubjectId	20	Text
Subject Last Name	Subject -> LastName	20	Text
Subject First Name	Subject -> FirstName	20	Text
Subject Middle Initial	Subject -> MI	1	Text
Subject Sex	Subject -> Sex	1	Text
Subject Birth Date	Subject -> Birthdate	8	Text CCYYMMDD
User-Defined Field	Subject -> Usrdef0	10	Text
User-Defined Field	Subject -> Usrdef1	10	Text
User-Defined Field	Subject -> Usrdef2	10	Text
User-Defined Field	Subject -> Usrdef3	10	Text
User-Defined Field	Subject -> Usrdef4	10	Text
Subject Language	Subject -> Lang	2	Number*
Subject Comment	Subject -> Comment	4000	Text
Subject in Hearing Conservation Program	Subject -> InProgram	1	Number 0- Not in Program 1- In Program
Subject Hire Date	Subject -> HireDate	8	Text CCYYMMDD
Status	Subject -> Usrdef6	20	Text
Subject Address line 1	Subject -> Addr1	20	Text
Subject Address line 2	Subject -> Addr2	20	Text
Subject City	Subject -> City	20	Text
Subject State	Subject -> State	2	Text
Subject Zip Code	Subject -> Zip	9	Text
Subject Email	Subject -> Email	65	Text
Test Date	Tests -> TestDate	8	Text CCYYMMDD
Test Time	Tests -> TestTime	6	Text HHMMSS
Examiner	Tests -> Examiner	20	Text
Test Type	Tests -> TestType		Number BITMAPPED
Left 500 Hz Threshold	Tests -> LeftThres500	3	Text
Left 1kHz Threshold	Tests -> LeftThres1000	3	Text
Left 2kHz Threshold	Tests -> LeftThres2000	3	Text

Copyright 2008 SRMi Consulting, LLC

Left 3kHz Threshold	Tests -> LeftThres3000	3	Text
Left 4kHz Threshold	Tests -> LeftThres4000	3	Text
Left 6kHz Threshold	Tests -> LeftThres6000	3	Text
Left 8kHz Threshold	Tests -> LeftThres8000	3	Text
Right 500 Hz Threshold	Tests -> RightThres500	3	Text
Right 1kHz Threshold	Tests -> RightThres1000	3	Text
Right 2kHz Threshold	Tests -> RightThres2000	3	Text
Right 3kHz Threshold	Tests -> RightThres3000	3	Text
Right 4kHz Threshold	Tests -> RightThres4000	3	Text
Right 6kHz Threshold	Tests -> RightThres6000	3	Text
Right 8kHz Threshold	Tests -> RightThres8000	3	Text
Audiometer Model	Tests -> Model	10	Text
Aud. Calibration Date	Tests -> CalDate	8	Text CCYYMMDD
Aud. Serial Number	Tests -> SerNum	5	Text
Sound Level Meter Frequency	Tests -> SlmFreq125	4	Number
Sound Level Meter Frequency	Tests -> SlmFreq250	4	Number
Sound Level Meter Frequency	Tests -> SlmFreq500	4	Number
Sound Level Meter Frequency	Tests -> SlmFreq1000	4	Number
Sound Level Meter Frequency	Tests -> SlmFreq2000	4	Number
Sound Level Meter Frequency	Tests -> SlmFreq4000	4	Number
Sound Level Meter Frequency	Tests -> SlmFreq8000	4	Number
Sound Level Meter Test Status	Tests -> SlmTestStatus	1	Number 1- In Range
Sound Level Meter Model	Tests -> SlmModel	10	Text
Sound Level Meter Calibration Date	Tests -> SlmCalDate	8	Text CCYYMMDD
Sound Level Meter Serial Number	Tests -> SlmSerNum	5	Text

Copyright 2008 SRMi Consulting, LLC

Sound Level Meter MPANL 125	Tests -> SlmMpan125	4	Number
Sound Level Meter MPANL 250	Tests -> SlmMpan250	4	Number
Sound Level Meter MPANL 500	Tests -> SlmMpan500	4	Number
Sound Level Meter MPANL 1000	Tests -> SlmMpan1000	4	Number
Sound Level Meter MPANL 2000	Tests -> SlmMpan2000	4	Number
Sound Level Meter MPANL 4000	Tests -> SlmMpan4000	4	Number
Sound Level Meter MPANL 8000	Tests -> SlmMpan8000	4	Number
User-Defined Field	Tests -> UsrDef40	40	Text
User-Defined Field	Tests -> UsrDef41	40	Text
User-Defined Field	Tests -> UsrDef42	40	Text
User-Defined Field	Tests -> UsrDef43	40	Text
User-Defined Field	Tests -> UsrDef44	40	Text
User-Defined Field	Tests -> UsrDef45	40	Text
User-Defined Field	Tests -> UsrDef45	40	Text
User-Defined Field	Tests -> UsrDef46	40	Text
User-Defined Field	Tests -> UsrDef47	40	Text
User-Defined Field	Tests -> UsrDef48	40	Text
User-Defined Field	Tests -> UsrDef49	40	Text
User-Defined Field	Tests -> UsrDef50	40	Text
User-Defined Field	Tests -> UsrDef51	40	Text
Test Comment	Tests -> Comment	4000	Text
Reject Audiogram	Tests -> Reject	1	Number 0- Not rejected 1- Rejected
Left Standard Threshold Shift from baseline at 2k, 3k, 4k	Tests -> LfSTSShift	5	Number
Left STS Analysis	Tests -> LfSTSAnalCode	5	Number
Left Recordable Shift	Tests -> LfRecShift	5	Number
Left Recordable Analysis	Tests -> LfRecAnalCode	5	Number
Left Original Baseline Average for 500, 1k, 2k, 3k	Tests -> LfOrgBaseAvg5123	5	Number
Left Original Baseline Average for 500, 1k, 2k	Tests -> LfOrgBaseAvg512	5	Number

Copyright 2008 SRMi Consulting, LLC

Left Original Baseline Average for 3k, 4k, 6k	Tests -> LfOrgBaseAvg346	5	Number
Left Ear is Better or Worse than the baseline at 2k, 3k, 4k	Tests -> LfBetterWorseCode	5	Number
Right Standard Threshold Shift from baseline at 2k, 3k, 4k	Tests -> RtSTSShift	5	Number
Right STS Analysis	Tests -> RtSTSAnalCode	5	Number
Right Recordable Shift	Tests -> RtRecShift	5	Number
Right Recordable Analysis	Tests -> RtRecAnalCode	5	Number
Right Original Baseline Average for 500, 1k, 2k, 3k	Tests -> RtOrgBaseAvg5123	5	Number
Right Original Baseline Average for 500, 1k, 2k	Tests -> RtOrgBaseAvg512	5	Number
Right Original Baseline Average for 3k, 4k, 6k	Tests -> RtOrgBaseAvg346	5	Number
Right Ear is Better or Worse than the baseline at 2k, 3k, 4k	Tests -> RtBetterWorseCode	5	Number
Was a retest done?	Tests -> RetestDone	1	Number 0-No 1-Yes
Is this test a retest?	Tests -> IsRetest	1	Number 0-No this test is not a retest 1-Yes this test is a retest

*The numbers for the languages are as follows:

English 0

Spanish 1

Hmong 2

German 3

Hindi 4

Tibetan 5

Vietnamese 6

French 7

Bosnian 8

Cambodian 9

Copyright 2008 SRMi Consulting, LLC

Russian 10

Somali 11

Italian 12

Japanese 13

Polish 14

Tagalog 15

Formats for Importing and Exporting

PLUS PACKAGE ONLY

The import and export functions are available only with the Plus Package.

The database has pre-defined formats for importing from and exporting to leading hearing conservation databases. The same formats are used for import or export so you may also export in a format that may be read directly by a third-party database. The format is chosen at the time of import or export.

If you are exporting data to Systoc version 7.2, see Systoc Export.

You may also create your own format(s). See the Custom Formats.

The factory-defined formats cannot be changed.

To see the list of formats:

1. From the File menu in the Control Window, choose Formats.

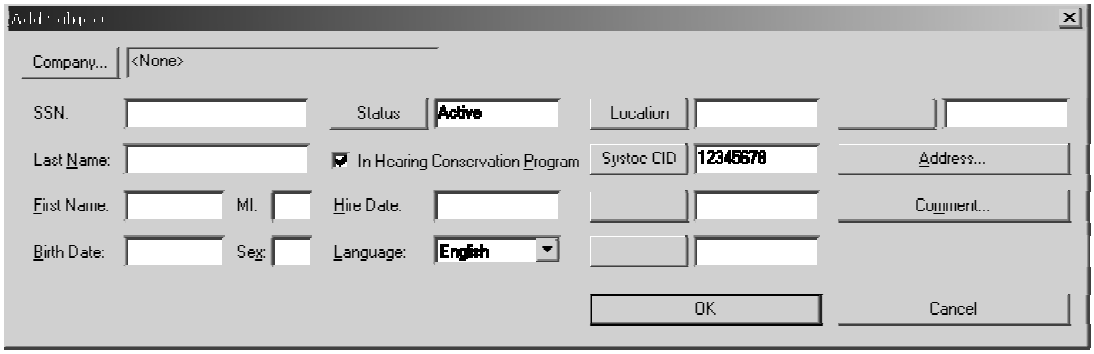
Systoc Export

The information in this section applies to users of Systoc version 7.2, a product of Occupational Health Research, who wish to export data from Benson Medical Instruments products to Systoc.

SETUP

In order to export to Systoc, each subject record must contain the Systoc Company ID (CID) code in the subject record UsrDef0 field. Refer to the figure below. The CID is generally an eight-digit number. (For information on changing the Prompt for a user-defined field, see Field Prompt.)

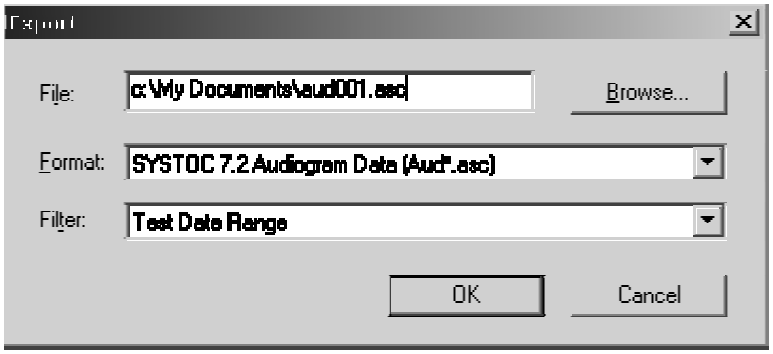
Copyright 2008 SRMi Consulting, LLC



EXPORT

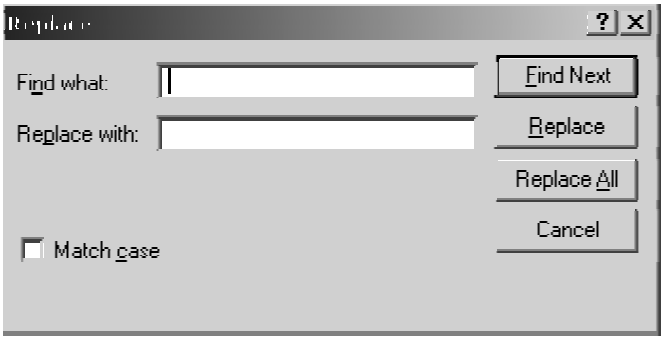
To export data to Systoc 7.2:

1. From the File menu in the Control Window, choose Export.
   The Export dialog box appears.
2. Choose the file to export to.
   Refer to the figure below. While the location is arbitrary, Systoc 7.2 requires the file name to begin with "aud" and have the ".asc" extension.



3. Choose a filter that gives the audiograms you wish to export. Take care to export no more than one test per subject per export. (Refer to notes 2, 3, and 4, below.)
4. When complete, click the OK button to begin the export.
5. Locate the file, right-click on it to display the context menu, and choose "Open with…". Choose Notepad from the resulting list of choices.
6. In Notepad, choose Replace from the Edit menu.
   The Replace dialog box appears. Refer to the figure below.

Copyright 2008 SRMi Consulting, LLC



7. Type a single space in the "Find what" edit box, making sure to type nothing in the "Replace with" edit box.
8. Click Replace All.
   This action has the effect of removing all spaces from the exported file.
9. When the operation is complete, click Cancel to close the Replace dialog box.
10. Choose Save from the File menu.
11. Choose Exit from the File menu.
    The resuting file may now be imported into Systoc.

NOTES

The following notes have been taken from import documentation provided to Benson Medical Instruments by Occupational Health Research and are reprinted as a service to the user. Contact Occupational Health Research with any questions regarding these notes.

1. Audiometer equipment records must be complete in Systoc prior to the start of the import.
2. All records being imported must have an exam date that is later than the date of any record for the same person that already exists or that has already been added within the same import file. Failure to adhere to this rule will cause baseline issues in Systoc.
3. You may not import two audio records for the same date or import an audio record for the same date as one that already exists. This will cause baseline errors.
4. You may not import records that are older than existing records for a given Employee ID. This will cause multiple records to be marked as baselines.

Custom Formats

PLUS PACKAGE ONLY

If the standard formats do not meet your needs, you may create your own format(s). There are two ways to create a custom import/export format. You may create a new format from scratch, or you may duplicate an existing format and then modify that. Users must have administrator access to add, modify, delete, or duplicate formats.

Copyright 2008 SRMi Consulting, LLC

The primary keys for each table are as follows:

Table	Primary Keys
Test	Test date, Test time, Company ID, Soc. Sec. No.
Subject	Company ID, Soc. Sec. No.
Company	Company ID
Histories	History date, History time, Company ID, Soc. Sec. No.

Formats must provide values for the fields composing the primary key. The Company ID field is provided implicitly as the current company's Company ID. Test Time and History Time fields will be assigned by the program if not provided.

Features such as field mapping, re-formatting, export-only fields, and trimming leading or trailing spaces enable you to deal with special circumstances of import or export. A format name may be up to 60 characters in length and include any typeable characters. The Record Size that you enter should include any terminating characters. See the following sections for more information.

Add Format Dialog Box

In creating or modifying a format, you will use the Add Format or Modify Format dialog box. The Add Format dialog box is accessed by choosing Formats from the File menu in the Control Window, then choosing the Add button.

In the Add Format or Modify Format dialog box, the Name edit box is for the name of the format you are adding.

The 'Table to include' combo box lists the available choices of Tests and Histories. Selecting Test will cause audiograms to be included in the format. Selecting Histories will cause histories to be included. A format cannot include both audiograms and histories.

In the Record Size group box, you can choose either a fixed-size record or variable-size record using the Fixed or Variable radio button. A fixed-length format can only contain fixed-length fields. A variable-length format may contain both fixed-length and delimited fields.

If you choose Variable, you will be able to enter information in the Record Delimiter and Field Delimiter edit boxes. Otherwise, these edit boxes will be gray and will not accept entries.

The Record Delimiter edit box is for the terminating character(s) for the record, if any. The Record Delimiter is optional and may be one or two characters.

The Field Delimiter edit box is for the terminating character(s) of all delimited fields in the record. The Field Delimiter is required and may be only one character.

Copyright 2008 SRMi Consulting, LLC

If the last delimited field of the record is the last field of the record, this field will be followed by the record delimiter as opposed to the field delimiter.

If you choose Fixed, the Size edit box will be available. The entry in the Size edit box should include any leading or terminating characters for each record, e.g., a terminating carriage return or line feed.

The Field Definitions group box contains Add, Modify, and Delete buttons for adding, modifying, or deleting fields in the custom format.

Fields in Import/Export Formats

PLUS PACKAGE ONLY

The Add Field/Modify Field dialog boxes enable you to add or modify fields in import/export formats that are not factory-defined. (One way of seeing the Add Field dialog box is by choosing Formats from the File menu in the Control Window, then choosing Add in the Formats dialog box, then choosing Add in the Add Format dialog box.)

In the Add Field or Modify Field dialog box, the ASCII Field group box contains the Export Default check box. If this box is checked, the field will only be used when exporting. Use this check box to add characters such as a carriage return or other static text to formats used as exports.

If the Format has a fixed Record Size, then the Offset represents the number of characters to the right of the first character that the first character of the field resides. (The first character of the record has an offset of 0.)

The Size edit box is for the size of the field. The size is the number of characters in the field. This edit box is not used for a delimited field.

➢Import:
If the ASCII field is larger than the database field, all extra characters of the ASCII field will be truncated unless appropriate format strings have been supplied to handle the difference.

➢Export:
Unless appropriate format strings have been supplied to handle the difference, if the database field is larger than the ASCII field, all extra characters of the database field will be truncated; if the database field is smaller, the rest of the ASCII field will be space-filled.

The Format edit boxes in the ASCII Field group box and the Database Field group box are for use when the characters of a field need to be rearranged. The maximum length of either string is 20 characters. For more information, see Re-formatting a Field.

The Database Field group box contains the Import Default check box. If this box is checked, the field will only be used when importing. Use this check box to add a static value to the selected database field.

Copyright 2008 SRMi Consulting, LLC

The Field combo box shows the table and field names, as well as the choice of 'None'. You would choose 'None' if you were importing only terminating characters, for example.

The Database Field group box contains options for handling leading and trailing spaces: see Leading and Trailing Spaces for more information.

The Fill check box sets either leading or trailing spaces to be filled with the specified character. Choose either the Leading or the Trailing radio button, and enter the character in the edit box.

The Field Mapping group box enables you to map fields. For more information, see Field Mapping and Bitmapped Field.

Field Mapping

PLUS PACKAGE ONLY

Using Field Mapping, you can supply a list of character strings in the ASCII column with strings in the Database column. In the case of import (the same concepts apply to export), if a field is not bitmapped, the database searches for an exact match in the ASCII column, and the first matching ASCII string that is found by the database is mapped to a database string. Subsequent field mappings after a match is found are ignored.

For example, if you are importing from a database in which 'Not Tested' is indicated by '--', you will need to use Field Mapping to replace the ASCII string '--' with 'NT'.

In the case of a bitmapped field, when a match is found, further field mappings are evaluated.

You can specify whether a given mapping is to be applied to import, export, or both.

You may use the wildcard character '?' to denote 'any character.'

Re-formatting a Field

PLUS PACKAGE ONLY

When importing from or exporting to other database formats, fields such as dates or Social Security number are often in different formats in the two databases. This database provides a mechanism to re-format fields. Field re-formatting is done by using the Format edit boxes in the Modify Field dialog box (see Modifying a Field in an Import/Export Format).

Perhaps the easiest way to explain this feature is by example. The examples will be taken from the perspective of importing data, but the same concepts apply to exporting. Assume for example that the employee birth date is stored in another database in the form "ddmmccyy", so that January 26, 1966, would be represented as "26011966". The database expects the birth date in the form "ccyymmdd". The employee birth date will therefore need to be re-formatted.

Copyright 2008 SRMi Consulting, LLC

The first step in re-formatting the birth date is to build a pair of template strings. Template strings represent how characters are moved from the ASCII field to the database field. In our example, we will use the strings "ABCDEFGH" for the ASCII field, and "EFGHCDAB" for the database field. "ABCDEFGH" would be entered into the Format edit box in the ASCII Field group box in the Modify Field dialog box, and "EFGHCDAB" would be entered into the Format edit box in the Database Field group box. Note that template strings are not enclosed in quotes when they are entered into Format edit boxes.

If a character in the first string (ASCII string) matches a character in the second string (database string), the corresponding character in the ASCII field is moved to the corresponding position in the database field. There are no predetermined formatting characters to be used in these strings; any typeable characters may be used. This function is case-sensitive, i.e., "m" and "M" are different characters. So we may also write the above template strings ("26011966" and "19660126") more mnemonically as "DdMmCcYy" and "CcYyMmDd".

Another example of the use of re-formatting involves Social Security Numbers. The database stores SSNs in the form "xxxxxxxxx". However, the database you are importing from may include dashes in SSNs in its export file: "xxx-xx-xxxx". In this case we would write the template strings as "123-45-6789" and "123456789". Because the dash characters appear in the ASCII string, but not in the database string, they are removed in the database field.

You can use this principle to create different date formats. For example, use the template strings "CcYyMmDd" and "Mm/Dd/CcYy" to re-format "17760704" as "07/04/1776".

For information on how to handle ASCII and Database fields of different sizes, see ASCII and Database Fields of Different Sizes.

To summarize the rules of import re-formatting:

- There are no standard format characters, but if a character in the ASCII string matches a character in the database string, the corresponding character is copied from the ASCII field to the corresponding position in the database field.
- A character that appears in the database string but not in the ASCII string is placed literally in the database field.
- A format string may contain any typeable character, but the maximum length of either string is 20 characters.
- For fields of different sizes, use format strings to handle the difference.

ASCII and Database Fields of Different Sizes

PLUS PACKAGE ONLY

If for a certain field the ASCII and Database fields are different in size, you must use format strings to handle the difference. For example, if in the Sex field you wished to map "M" in the ASCII field to "MAN" in the Database field, you would

Copyright 2008 SRMi Consulting, LLC

modify this field so that "A" would be the format string for the ASCII field, and "ABC" would be the format string for the Database field.

Bitmapped Field

PLUS PACKAGE ONLY

The database can automatically determine which audiograms are to be used as baseline audiograms. However, if you wish to indicate baseline audiograms without the aid of the software, you can use Field Mapping for this purpose. With Field Mapping, you can indicate whether an audiogram is to be used as an OSHA/MSHA STS Baseline or OSHA Recordable Shift/MSHA Reportable Shift Baseline audiogram. You will need to use the bitmapped field 'Tests -> TestType'.

The field ‘Tests -> TestType’ has a Database combo box with the selections ‘Bit 1’, ‘Bit 2’, ‘Bit 3’, and so on, up to ‘Bit 32’. For import, you must set the appropriate bit(s) to '1' for the audiogram to be used as either baseline using Field Mapping. For the bitmapped field, select the bit to set if a given ASCII string in the imported data is an exact match for the entry in the ASCII column of the Field Mapping columnar list. All other requirements of Field Mapping apply. For export, if the bit is set to '1', then the string in the ASCII column in the Field Mapping columnar list will be written to the ASCII field. When the first match is found, no others are checked.

Refer to the table below for the bits indicating particular types of baseline tests.

Test Type	Bit Number
reserved	Bit 1
(Left) OSHA/MSHA STS Baseline	Bit 2
(Left) OSHA Recordable Baseline	Bit 3
(Right) OSHA/MSHA STS Baseline	Bit 4
(Right) OSHA Recordable Baseline	Bit 5
(Left) MSHA Reportable Baseline	Bit 6
(Right) MSHA Reportable Baseline	Bit 7
reserved	Bit 8-24
user-defined	Bit 25-32

You can create a bitmapped field by adding one, or you can duplicate a format that contains a bitmapped field and modify that format.

Copyright 2008 SRMi Consulting, LLC

Leading and Trailing Spaces

PLUS PACKAGE ONLY

In creating or modifying a format, you will need to consider whether to trim leading spaces or trailing spaces, or to fill them with a specified character. Your best course of action will depend on the particular database you are importing from or exporting to.

For example, certain databases right-justify the last-name field, and in this case it would be best to trim the leading spaces. In another example, however, the month of July may be entered in one database as simply ' 7' rather than '07', and here it would be best to set leading spaces to be filled with the character zero rather than trim them.

If you opt to fill spaces, select the Fill check box and choose either the Leading or Trailing radio button. You can then enter the character in the edit box at right. The character must be a printable ASCII character.

This database expects that unused characters will contain nulls rather than spaces, so in general, fields should be trimmed.

Export-Only Fields

PLUS PACKAGE ONLY

You may wish to add a field in your format that is used only for export. For example, you might want to add terminating characters at the end of a record in the ASCII file. To add such a field, check the Export Default check box in the Add Field dialog box and enter the characters to appear in the export in the Format edit box.

Using Field Mapping

PLUS PACKAGE ONLY

To use field mapping:

1. From the File menu in the Control Window, choose Formats.
   The Formats dialog box appears.
2. Select the desired format.
3. Choose the Modify push button.
   The Modify Format dialog box appears.
4. In the Field Definitions group box, select the field for which you need to use Field Mapping.
5. Choose the Modify push button.
   The Modify Field dialog box appears.

Copyright 2008 SRMi Consulting, LLC

6. In the Field Mapping group box, choose the Add push button.
7. In the Add Mapping dialog box, supply character strings in the ASCII and Database edit boxes.
8. Use the check boxes to indicate whether you wish this mapping to be applied to import, export, or both.
9. Choose OK.
10. When finished with the Modify Field dialog box, choose Close.
11. When finished with the Modify Format dialog box, choose Close.
12. In the Formats dialog box, choose Close.

Adding a Format

PLUS PACKAGE ONLY

To add an import/export format:

1. From the File menu in the Control Window, choose Formats.
   The Formats dialog box appears.
2. Choose the Add push button.
   The Add Format dialog box appears.
3. Enter the name of the new format in the Name edit box.
4. Choose whether the format will be fixed-length or variable-length.
   A fixed-length format can only contain fixed-length fields. A variable-length format may contain both fixed-length and delimited fields.
5. If you chose to create a fixed-length format, enter the size of the record in the Record Size edit box.
   This size should include any leading or terminating characters for each record, e.g., a terminating carriage return or line feed.
6. If you chose to create a variable-length format, enter the Record Delimiter and Field Delimiter.
   The Record Delimiter is optional and may be one or two characters. The Field Delimiter is required and may be only one character.
7. In the Field Definitions group box, choose the Add push button.
   The Add Field dialog box appears.
8. Enter the desired characteristics of the new field and choose Close.
9. Repeat the previous step for all desired fields.
10. When finished with the Add Format dialog box, choose Close.
11. In the Formats dialog box, choose Close.

Copyright 2008 SRMi Consulting, LLC

Modifying a Format

PLUS PACKAGE ONLY

To modify an import/export format:

1. From the File menu in the Control Window, choose Formats.
   The Formats dialog box appears.
2. Choose the Modify push button.
   The Modify Format dialog box appears.
3. Modify the name of the format in the Name edit box.
4. Modify the size of the record in the Record Size edit box.
5. In the Field Definitions group box, choose the field you wish to modify.
6. Choose the Modify push button.
   The Modify Field dialog box appears.
7. Modify the field as desired.
8. When finished with the Modify Field dialog box, choose Close.
9. When finished with the Modify Format dialog box, choose Close.
10. In the Formats dialog box, choose Close.

Deleting a Format

PLUS PACKAGE ONLY

To delete an import/export format:

1. From the File menu in the Control Window, choose Formats.
   The Formats dialog box appears.
2. Choose the format you wish to delete.
3. Choose the Delete push button.
4. Choose Close.

Duplicating a Format

PLUS PACKAGE ONLY

To duplicate a format:

1. From the File menu in the Control Window, choose Formats.
2. In the Formats dialog box, select the format you wish to copy in the list box.
3. Choose the Duplicate push button.
   A copy of the format will appear in the list box.

Copyright 2008 SRMi Consulting, LLC

4. When finished with the Formats dialog box, choose Close.

Adding a Field

PLUS PACKAGE ONLY

To add a field in an import/export format:

1. From the File menu in the Control Window, choose Formats.
   The Formats dialog box appears.
2. Choose the format in which you wish to add a field.
3. Choose the Modify push button.
   The Modify Format dialog box appears.
4. In the Field Definitions group box, choose the Add push button.
   The Add Field dialog box appears.
5. Enter the field information as desired. For more information, see Fields in Import/Export Formats .
6. When finished with the Add Field dialog box, choose Close.
7. When finished with the Modify Format dialog box, choose Close.

Modifying a Field in an Import/Export Format

PLUS PACKAGE ONLY

To modify a field in an import/export format:

1. From the File menu in the Control Window, choose Formats.
   The Formats dialog box appears.
2. Choose the format in which you wish to modify a field.
3. Choose the Modify push button.
   The Modify Format dialog box appears.
4. In the Field Definitions group box, select the field you wish to modify and choose the Modify push button.
   The Modify Field dialog box appears.
5. Make changes as desired.
6. When finished with the Modify Field dialog box, choose Close.
7. When finished with the Modify Format dialog box, choose Close.

Copyright 2008 SRMi Consulting, LLC

Deleting a Field

PLUS PACKAGE ONLY

To delete a field in an import/export format:

1. From the File menu in the Control Window, choose Formats.
   The Formats dialog box appears.
2. Choose the format in which you wish to delete a field.
3. Choose the Modify push button.
   The Modify Format dialog box appears.
4. In the Field Definitions group box, select the field you wish to delete.
5. Choose the Delete push button.
6. When finished with the Modify Format dialog box, choose Close.
7. When finished with the Formats dialog box, choose Close.

Export Filters

PLUS PACKAGE ONLY

You may apply a filter when exporting data. The factory-defined filters are:

- Current Company
- History Date Range (in the current company)
- Test Date Range (in the current company)

Factory-defined filters may not be modified or deleted.

You also have the option of adding your own filter(s). Users must have administrator access to add, modify, or delete filters. You will need to use SQL when entering the filter expression. Any filter that you add will appear in the Filter combo box in the Export dialog box. Refer to Database Field Definitions for table names and field names, and to The ASK() Function and The ASKSYS() Function for information on these functions.

See the following sections for information on adding, modifying, and deleting filters.

To see the list of filters:

1. From the File menu in the Control Window, choose Filters.

Copyright 2008 SRMi Consulting, LLC

Adding a Filter

PLUS PACKAGE ONLY

To add an export filter:

1. From the File menu in the Control Window, choose Export Filters.
   The Filters dialog box appears.
2. Choose the Add push button.
   The Add Filter dialog box appears.
3. Enter the filter name in the Filter Name edit box.
4. Enter the filter expression, using SQL, in the Filter Expression edit box.
5. Choose OK.
6. When finished with the Filters dialog box, choose Close.

Modifying a Filter

PLUS PACKAGE ONLY

To modify an export filter:

1. From the File menu in the Control Window, choose Export Filters.
   The Filters dialog box appears.
2. Select the filter you wish to modify in the list.
3. Choose the Modify push button.
   The Modify Filter dialog box appears.
4. Modify the filter as desired.
5. Choose OK.
6. When finished with the Filters dialog box, choose Close.

Deleting a Filter

PLUS PACKAGE ONLY

To delete an export filter:

1. From the File menu in the Control Window, choose Export Filters.
   The Filters dialog box appears.
2. Select the filter you wish to delete in the list.
3. Choose the Delete push button.
   A dialog box will appear, asking you whether you wish to delete the filter.
4. Choose Yes.

Copyright 2008 SRMi Consulting, LLC

5. When finished with the Filters dialog box, choose Close.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

User-Defined Fields

User-Defined Data Fields

Most data fields with a push button are user-definable. This means that you may chose a different prompt (the text that shows on the button) for the field, and other options such as real-time formatting, data validation, and default data.

For an OSHA or MSHA hearing conservation program, you will need to specify a data field for the subject's job classification and most recent noise exposure assessment, and examiner's name or ID if this information will not be available elsewhere. All other required information is automatically gathered by the audiometer.

All user-defined fields allow 40 characters, with the exception of the Examiner field (20 characters) and the Comment field (4000 characters).

Data Field Settings

Special options for data fields such as look-up box entries and validation are set in the expanded dialog box for the given data field.

To enter or change settings for a data field:

1. Press the push button for the data field.
   The data field's look-up dialog box appears.
2. Press the Advanced push button.
   The dialog box expands.
3. Make changes as desired.
4. When finished, choose OK.

Modifying a Data Field

You can change the prompt and set up features such as validation and real-time formatting for any data field.

To modify a data field:

1. Choose the push button for the data field.
   The data field's look-up dialog box appears.
2. Choose the Advanced push button.
   The dialog box expands.
3. Make changes as desired using the push buttons and edit boxes.
4. When finished, choose OK.

Copyright 2008 SRMi Consulting, LLC

Look-up Boxes

Data fields have look-up boxes that will hold a list of choices for the field. You may use this feature to standardize the field contents or to save time in entering data.

To choose an entry from the look-up box:

1. Choose the data field's push button.
   The field's look-up dialog box appears.
2. Select the entry from the list box and choose OK.
   You may also double-click the entry with the mouse.

To add, modify or delete entries from the look-up box:

1. Choose the Advanced push button.
   The dialog box expands.

- To modify or delete an entry, select the entry from the list box and press the appropriate push button.
- To add an entry, press the Add push button, type the new entry in the edit box, and choose OK.

To change the order of entries in the look-up box:

1. Choose the Advanced push button.
   The dialog box expands.
2. Select an entry and press the Item Up and Item Down push buttons to move the entry in the list.

Field Prompt

The field prompt is the label that appears on the data field push buttons. You can change the prompt for most data field buttons.

To change the prompt:

1. Choose the push button to the left of the data field's edit box.
   The field's look-up dialog box appears.
2. Choose the Advanced push button.
   The dialog box expands.
3. In the Prompt edit box, delete the old prompt and type the new one.
4. Choose OK.

Copyright 2008 SRMi Consulting, LLC

Field Default

You may assign a default entry for most data fields. This default will appear automatically in a data field for new records. This feature is useful for fields that are often the same from record to record, such as a technician ID field.

To set the field default:

1. Choose the data field's push button.
   The field's look-up dialog box appears.
2. Choose the Advanced push button.
   The dialog box expands.
3. Choose the desired item in the list box at left.
   If the item is not in the list, add it by using the Add push button.
4. Choose the Set Default push button.
5. Choose OK.

Real-Time Formatting

Certain field types, such as date fields or the Social Security number field, must conform to certain formats. The separator characters (e.g. slashes and dashes) can be automatically inserted for you as you type. This is referred to as real-time formatting.

The three formats that you may choose are date (mm/dd/yyyy), time (hh:mm:ss), and Social Security number (xxx-xx-xxxx).

To choose real-time formatting for a data field:

1. Choose the push button for the data field.
   The field's look-up dialog box appears.
2. Choose the Advanced push button.
   The dialog box expands.
3. Press the Format push button.
   The Real-Time Format dialog box appears.
4. Un-select the Disable Real-Time Format check box.
5. Select the radio button for the correct format and choose OK.
6. In the data field’s dialog box, choose OK.

Data Validation for User-Defined Fields

The data in most data fields can be validated each time the OK push button is chosen in the dialog box. If a field contains invalid data, a message box appears, warning that the field is invalid. You can:

Copyright 2008 SRMi Consulting, LLC

- choose to validate data by format, by legal characters, or by ensuring that an entry matches a list item
- give each data field custom validation

To see the Data Validation dialog box:

1. Choose the push button for the data field.
   The field's look-up dialog box appears.
2. Choose the Advanced push button.
   The dialog box expands.
3. Press the Validation push button.
   The Data Validation dialog box appears.

Format Validation

With format validation, the software validates data by verifying that a field conforms to a particular format, such as date or Social Security number. The available formats are described in the table below. See also the following sections: Lock to List Validation and Legal Character Validation .

Format Type	Description
Date	dates in the format mm/dd/ccyy
Time	time in the format hh:mm:ss, 24-hour time
Social Security No.	Social Security number in the format xxx-xx-xxxx
Threshold	Hearing threshold in dB HTL. Valid thresholds are 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95. Valid error codes are NR, MR, SE, CR, RN, PT. (For an explanation of the codes, see Error Descriptions.)
Sex	May be either 'M' or 'm' for male, or 'F' or 'f' for female

Lock to List Validation

One of the data validation choices is ‘Lock to List.’ If this is chosen, the software ensures that the entry matches an entry in the field’s look-up dialog box. The user may either type the entry or select it from the data field look-up box. For more information on look-up boxes, see Look-up Boxes .

Copyright 2008 SRMi Consulting, LLC

Legal Character Validation

Legal character validation verifies that the individual characters of a field belong to a particular subset of characters. The subsets are defined in the table below. Examples of fields for which the legal character type is useful is a department field where the department code is made up of a letter followed by three numerals, or a field that may be 'Y' or 'N'.

In the Legal Characters group box in the Data Validation dialog box, Size refers to the minimum number of characters allowable in the field. For example, if the validation Size is set to 8, a validation error will be triggered if fewer than eight characters are entered. The maximum value of validation Size is 50.

Offset refers to the number of characters to the right of the first field character for which the validation is being specified. For example, an offset of 0 refers to the first character.

If the User-Defined radio button is selected, enter the list of legal characters for this offset in the User-Defined Characters edit box.

Legal Characters Subset	Definition
Any ASCII Character	the 92 typeable ASCII characters, from space (ASCII 32) to the tilde (~, ASCII 126)
Alphabetic Character Only	the upper and lower case letters and the space character
Digit Only	the ten digits, 0 to 9
User-Defined Characters	a mechanism by which you can define your own subset of up to twenty characters

Adding Format Validation to a Field

1. Choose the push button for the data field.
   The field's look-up dialog box appears.
2. Choose the Advanced push button.
   The dialog box expands.
3. Press the Validation push button.
   The Data Validation dialog box appears.
4. Un-select the Disable Validation check box (so that the X is removed from the box).
5. In the Validation Type group box, select the radio button of the desired format.
   Because you are not using legal character validation, the settings in the Legal Characters group box have no effect and may be ignored.
6. Choose OK.

Copyright 2008 SRMi Consulting, LLC

7. In the data field’s dialog box, choose OK.

Adding Lock to List Validation to a Field

To add Lock to List validation to a field:

1. Choose the push button for the data field.
   The field's look-up dialog box appears.
2. Choose the Advanced push button.
   The dialog box expands.
3. Press the Validation push button.
   The Data Validation dialog box appears.
4. Un-select the Disable Validation check box (so that the X is removed from the box).
5. In the Validation Type group box, choose the Lock to List radio button.
6. Choose OK.
7. In the data field’s dialog box, choose OK.

Adding Legal Character Validation to a Field

To add legal character validation to a field:

1. Choose the push button for the data field.
   The field's look-up dialog box appears.
2. Choose the Advanced push button.
   The dialog box expands.
3. Press the Validation push button.
   The Data Validation dialog box appears.
4. Un-select the Disable Validation check box (so that the X is removed from the box).
5. In the Validation Type group box, select the radio button for Legal Characters.
6. In the Legal Characters group box, enter the validation Size.
7. For each value of validation Offset, choose the appropriate radio button in the Legal Characters group box.
   If you select the radio button for User-Defined, use the User-Defined Chars (Characters) edit box as needed.
8. Choose OK.
9. In the data field’s dialog box, choose OK.

Copyright 2008 SRMi Consulting, LLC

Disabling Data Validation for a Field

To disable data validation for a field:

1. Choose the push button for the data field.
   The field's look-up dialog box appears.
2. Choose the Advanced push button.
   The dialog box expands.
3. Choose the Validation push button.
   The Data Validation dialog box appears.
4. Select the Disable Validation check box.
5. Choose OK.
6. In the data field’s dialog box, choose OK.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Data Transfer

Data Transfer

The data transfer method you use will depend on several factors, including 1) whether your database is a Benson Medical Instruments product, 2) whether you are doing a real-time transfer or a group audiogram transfer, and 3) which third-party database you are using (if applicable). Use the Database Interface combo box in the Setup dialog box to choose your database. (To see the Setup dialog box, choose Setup from the Audiometer menu.)

Is Your Database a Benson Medical Instruments Product?

Your audiometer can efficiently transfer data to virtually all third-party databases. However, transfer to a Benson Medical Instruments database such as the Plus Package or Solo is the most streamlined, because for stored data it can be done using the Extract and Merge functions. These functions enable you to move data from multiple companies in one operation, for example. For data transfer to a non-Benson Medical database, you have several options available. An important consideration is whether your transfer is of stored data, or is done in real time at the end of a test.

Are You Doing a Real-Time Transfer or a Group Audiogram Transfer?

A real-time transfer is one that takes place immediately upon the completion of an audiogram. The audiometer is connected by a cable to a computer with the database on it. Instead of being stored in the audiometer software, the audiogram that has just been performed is transferred electronically to the database software.

A group audiogram transfer is the transfer of data that has been stored in Plus Package, an optional database integrated with your audiometer. It can be done electronically directly to the software, or it can be accomplished by copying data to a file.

Whlch Third-Party Database Are You Using?

For the transfer of a just-performed audiogram, you will use either a Benson Medical Instruments protocol or an RA 500 protocol, depending on your database.

Data transfer is discussed in more detail in the following sections.

For Information on ASSIGNING, SAVING, PRINTING:

If you are using Storage as your Database Interface, see the sections beginning with Assigning a Subject for procedures for assigning a subject, saving an audiogram, and printing an audiogram.

Copyright 2008 SRMi Consulting, LLC

If you are not using Storage as your Database Interface, see the sections beginning with Third-Party Databases for procedures and information on assigning a subject, saving an audiogram, and printing an audiogram.

Data Transfer between Benson Medical Products

If you are transferring data between Benson Medical Instruments products (Solo and the Plus Package are Benson Medical Instruments databases), there are two possible methods, described below. Which alternative you choose will depend on such factors as physical location, network availability, and whether the method is bidirectional or unidirectional.

NETWORK (Plus Package only)

If you are on a network, the data can be located in a shared database. In this situation you have real-time access to all the data from any audiometer or computer on the network. This setup would be useful if you had locations that were physically separated but that needed access to the same data. See Multi-User Installation.

EXTRACT/MERGE (Plus Package only)

Perhaps you intend to move your audiometer from place to place for testing, all the while storing tests, and later transfer the tests to a fixed database. With Extract and Merge, the data you transfer will not have to be limited to the current company and to two categories such as 'subjects' and 'audiograms.' You can choose a configuration such as 'all subjects/audiograms/medical histories in a date range,' or even choose to transfer all data at once. See Extracting Records: An Overview and Merging Records: An Overview.

Data Transfer Using a Third-Party Database

If you are transferring data between the audiometer and a third-party database, there are three possible methods, depending on such factors as what your database supports and the availability of a compatible data format. The methods are described below.

IMPORT/EXPORT (Plus Package only)

The Import and Export functions are recommended if you are testing at remote locations and then transferring your stored tests to a database. This method is bidirectional because the Plus Package has the same formats for both import and export. Therefore you could export data in a given format, and later import updated data in the same format. In order to use Import and Export, you will have to make sure that the audiometer has an export format that is supported by your database. See Export Overview and Import Overview.

BATCH TRANSFER USING RA 500 PROTOCOL

Batch Transfer using RA 500 protocol is appropriate for moving data that has been stored in the audiometer over to a database. For this method to work, your database

Copyright 2008 SRMi Consulting, LLC

would have to support RA 500 batch transfer. FOSHM and Systoc support RA 500 batch transfer. This transfer only goes in one direction: from the audiometer to a database. See Data Transfer Using RA 500 Protocol, below.

REAL-TIME AUDIOGRAM TRANSFER USING BENSON MEDICAL PROTOCOL

Many third-party databases have support for real-time transfer from the audiometer using Benson Medical protocol. This protocol is bidirectioinal in that it allows a subject to be Assigned before or during the test in order to make use of previous audiogram data.

Currently supported interfaces are DOHRS-HC, HearTrak (DOS), HearTrak (Windows), OHM, and Medgate. All that is required for the audiometer software to use these interfaces is to set the Database Interfaces combo box in the Setup dialog box to the correct interface. In addition, you must perform the needed setup in the database program. Refer to the third-party documentation for information on how to do this.

REAL-TIME AUDIOGRAM TRANSFER USING RA 500 PROTOCOL

In order to perform this real-time transfer, the audiometer must be close enough to the computer with the database that the two can be connected by cable. The database must also support a transfer from an RA 500. FOSHM and Systoc support this type of transfer. See Data Transfer Using RA 500 Protocol, below.

Data Transfer Using RA 500 Protocol

FOSHM (RA 500 protocol)

SYSTOC (RA 500 protocol)

In order to operate with these two databases, the audiometer must be set up to emulate an RA 500; see the next section for the procedure. The RA 500 communicates through a serial port, and you will need to set the serial port settings on the audiometer to match those of an RA 500. The database must also be set up to communicate with an RA 500; that is, the serial port settings on the audiometer and the database must match.

This transfer method requires two additional serial ports, one for the data from the audiometer and the other for the incoming data to the database. Since PCs do not typically have these two additional serial ports, it is more convenient to use a third-party program that creates virtual serial port pairs in software. After these virtual ports are created, you may connect to them as required above and the data will be transferred correctly. Contact your Benson Medical Instruments dealer for information on these third-party programs.

In an example of a configuration using virtual serial port utility software, a cable would connect the audiometer to ‘COM 1’ of the computer, the Database Interface

Copyright 2008 SRMi Consulting, LLC

Serial Port Settings in the audiometer software would be set to ‘COM 2’, and the serial port setting in the database would be set to ‘COM 3’. The virtual serial port utility software would be configured to create the connected pair of ports COM 2 and COM 3.

Real-time transfer is initiated from the database side. Refer to the database documentation. For real-time transfer, the Database Interface in the audiometer software must be set to FOSHM or Systoc.

Batch transfer is performed by means of the Export function, with Tremetrics RA500 Test as the export format. For batch transfer, the Database Interface must be set to Storage. See Batch Transfer Using RA 500 Protocol, below.

Batch Transfer Using RA 500 Protocol

To perform a batch transfer using RA 500 protocol:

1. Make sure the Database Interface in the Setup dialog box is set to Storage.
   To see the Setup dialog box, choose Setup from the Audiometer menu.
2. Choose Export from the File menu.
   The Export dialog box appears.
3. In the Format combo box, choose Tremetrics RA500 Test.
4. Choose the desired filter in the Filter combo box.
5. In the Output group box, choose the Serial Port radio button.
6. Choose the Serial Port Settings button.
   The Serial Port Settings dialog box appears.
7. Select the same settings as are indicated in the database software for the RA 500.
8. Choose OK.

Third-Party Databases

The audiometer operates with a number of different hearing conservation databases. Procedures and information on assigning a subject, saving an audiogram, and printing an audiogram are listed below for each database. These procedures are meant to be used in conjunction with the database documentation. Terminology may differ slightly, e.g., a database or its documentation may not use the word "assign" when discussing subjects and their audiograms.

DOHRS-HC

If you are using DOHRS-HC as your database interface, the procedures for assigning a subject and saving a test will be initiated on the database side. Refer to your database documentation for the procedures, keeping in mind that the documentation may not use the term "assign."

For information on printing a test, refer to the database documentation.

Copyright 2008 SRMi Consulting, LLC

FOSHM

If the database interface you are using is FOSHM, you will need to set up the audiometer to emulate an RA 500. See the sections beginning with Data Transfer Using RA 500 Protocol in this documentation for audiometer settings and other information about real-time and batch transfer. For database settings refer to your database documentation.

Follow the procedure below to assign a subject. Refer to the database documentation for details and further instructions.

To assign a subject:

1. Choose Assign Subject from the Audiometer menu.
   The Assign Subject dialog box appears.
2. Enter the Patient ID number and the Examiner.
3. Choose the Assign button.

Hear Trak (DOS)

If the database interface you are using is HearTrak (DOS), follow the procedures below to assign a subject and save an audiogram. Refer to the database documentation for details and further instructions.

For information on printing an audiogram, refer to the database documentation.

To assign a subject:

1. In HearTrak, enter the subject's Social Security number.
2. 'Send' information about the subject to the audiometer.

To save an audiogram:

1. When the test status indicates Finished, in HearTrak, 'get' the data from the audiometer.

HearTrak (Windows)

If the database interface you are using is HearTrak (Windows), follow the procedures below to assign a subject and save an audiogram. Refer to the database documentation for details.

For information on printing an audiogram, refer to the database documentation.

To assign a subject:

1. Choose Assign Subject from the Audiometer menu.
   Refer to database documentation for further instructions.

Copyright 2008 SRMi Consulting, LLC

To save a test:

1. When the test status indicates Finished, choose Save/Print Test from the Audiometer menu.
   Refer to database documentation for further instructions.

Medgate

If the database interface you are using is Medgate, follow the procedures below to assign a subject and save an audiogram. Refer to the database documentation for details.

For information on printing an audiogram, refer to the database documentation.

To assign a subject:

1. Choose Assign Subject from the Audiometer menu.
   Refer to database documentation for further instructions.

To save an audiogram:

1. When the test status indicates Finished, choose Save/Print Test from the Audiometer menu.
   Refer to the database documentation for further instructions.

OHM

If the database interface you are using is OHM, follow the procedures below to assign a subject and save an audiogram. Refer to the database documentation for details and further instructions.

For information on printing an audiogram, refer to the database documentation.

To assign a subject:

1. In OHM, assign a subject.
   The subject will automatically be assigned in the audiometer software.

To save an audiogram:

1. When the test status indicates Finished, choose Save/Print Test from the Audiometer menu.
   Refer to the database documentation for further instructions.

Systoc

If the database interface you are using is Systoc, you will need to set up the audiometer to emulate an RA 500. See the sections beginning with Data Transfer Using RA 500 Protocol in this documentation for audiometer settings and other information about real-time and batch transfer. For database settings refer to your database documentation.

Copyright 2008 SRMi Consulting, LLC

Follow the procedure below to assign a subject. Refer to the database documentation for details and further instructions.

To assign a subject:

1. Choose Assign Subject from the Audiometer menu.
   The Assign Subject dialog box appears.
2. Enter the Patient ID number and the Examiner.
3. Choose the Assign button.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Sound Level Meter

Sound Level Meter

The Sound Level Meter that is mapped to the audiometer determines whether the ambient sound level during an audiogram is within permissible levels. The recorded noise levels appear in an information tab in the Control Window, where they are updated once a second. The last readings taken by the sound level meter are saved with the test results.

You can choose to have a stimulus automatically presented again if the ambient noise level during the stimulus exceeded permissible levels, by selecting the Retest on Noise Above MPANL check box in the Test Configuration. If this check box is selected, responses will not be recorded and the stimulus will automatically be presented again if the ambient sound level during the stimulus was too high. See Retest on Noise Above MPANL for more information.

For information on installing the Sound Level Meter, see Installing the BAS-200slm or SLM-200.

You can see sound level readings updated once a second in the Control Window. The readings are updated to the maximum value since the last update. See the next section.

If a sound level meter is installed and mapped to a particular audiometer, the set of last sound level readings taken during the test will be saved with the audiogram. Mapping is done using the Sound Level Meter Mapping tab in the Setup dialog box. See Configuring the Sound Level Meter.

For the determination of permissible levels you can use one of the two industry standards, OSHA 29 CFR 1910-1983 and ANSI S3.1-1999, or you can choose the Custom option, in which you choose the maximum permissible ambient noise levels. You choose these options using the 'MPANLs' tab in the Test Configuration dialog box. See MPANLs.

You can automatically prohibit testing if the Sound Level Meter is overdue for annual calibration. See Prohibit Audiogram without Sound Level Meter Calibration.

Annual calibration of the sound level meter requires the same hardware key that is used for audiometer annual calibration. You can set up the software to warn you as the day for Sound Level Meter annual calibration approaches. See Audiometer Setup.

Sound Level Meter Information Tab

The Sound Level Meter Information Tab appears at the bottom of Audiogram View in the Control Window. It displays sound level readings in numerical and graph form that are updated once a second. The sound level reading is updated to the maximum value since the last update. On the Sound Level Graph, 'db SPL' stands for decibel Sound Pressure Level.

You can choose to have the sound level readings updated ten times a second by selecting the Continuous Update Display check box.

Copyright 2008 SRMi Consulting, LLC

The readings that appear are taken by the sound level meter that is mapped to this audiometer. For information on sound level meter mapping, see Configuring the Sound Level Meter.

If the permissible sound level (Maximum Permissible Ambient Noise Level, or MPANL) for a particular octave band is exceeded, the bar on the graph turns red above the permissible level. The standard used for determining the permissible level is set in the MPANLs tab in the Test Configuration dialog box. See MPANLs.

Sound Level Meter Annual Calibration

You will need a calibrator in order to perform annual calibration of the sound level meter. Instructions are given on screen during the calibration. First you will be asked to attach the microphone to the calibrator and the sound level meter. When calibration is finished, you will be instructed to attach the microphone to the audiometer and the sound level meter, so that linearity can be checked.

The hardware key that is used for sound level meter annual calibration is the same one that is used for annual calibration of the audiometer.

To perform annual calibration for the sound level meter:

1. Install the hardware key (see Installing the Annual Calibration Hardware Key).
2. From the Control Window, select Sound Level Meter Annual Calibration from the Audiometer menu.
   The Calibration Sound Level Meter dialog box appears.
3. In the Description field, enter the sound level meter location, reason for calibration, or other comments.
4. Enter the name of the individual or company calibrating the sound level meter in the Calibrated By group box, and information about the test equipment in the Sound Level Meter, Audiometer, and Acoustic Calibrator group boxes.
5. Choose the Calibrate push button.
6. Follow the on-screen instructions for calibration.
7. When calibration is finished, follow the on-screen instructions for linearity checking.
8. Save and/or print the report, if desired.
   See the sections below.

To save the annual calibration report:

1. In the Calibration Sound Level Meter dialog box, choose the Options push button.
   The Calibration Options dialog box appears.
2. Check the Print to Screen check box and press OK.
3. In the Calibration Sound Level Meter dialog box, press the Print push button.
   The Report window appears.

Copyright 2008 SRMi Consulting, LLC

4. Press the export push button.
   The Export dialog box appears.
5. Choose the appropriate format and destination.
   Depending on the format and destination you choose, the dialog boxes and choices will vary.

To view the saved annual calibration report:

1. Open the file you created in Step 5, above, using the appropriate application for that file type.

To print the annual calibration report:

1. In the Calibration Sound Level Meter dialog box, choose the Print push button.

Sound Level Meter Calibration Warning

To set or change the annual calibration warning for the Sound Level Meter:

1. Install the hardware key (see Installing the Annual Calibration Hardware Key).
2. Under the Audiometer menu, choose Sound Level Meter Annual Calibration.
3. Press the Options push button.
   The Calibration Options dialog box will appear.
4. Type your desired message in the five Annual Calibration Warning Message edit boxes.
   Each of the five boxes may contain up to 50 characters.
5. When finished, choose the OK button.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

STS Definitions

Standard Threshold Shift (STS)

A Standard Theshold Shift (STS) is defined by both OSHA and MSHA as an average change of greater than or equal to 10dB at 2000, 3000, and 4000 Hz in either ear.

Standard Threshold Shift with Age Correction

A Standard Threshold Shift (STS) with Age Correction is defined by both OSHA and MSHA as an average change of greater than or equal to 10dB at 2000, 3000, and 4000 Hz in either ear after adjusting the baseline and current thresholds for presbucysis per 29 CFR 1910.95.

DOD Significant Threshold Shift

A DOD Significant Threshold Shift is defined as an average change of greater than or equal to 10dB at 2000, 3000, and 4000 Hz in either ear, or a change of greater than or equal to 15dB at 1000, 2000, 3000, or 4000 Hz in either ear.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Cleaning

Cleaning

- Do not use harsh chemicals or solvents to clean the audiometer.
- Clean connections with LPS1 Greaseless Lubricant or equivalent.
- Do not use liquids or chemicals on headset transducers.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Specifications

Audiometer Specifications

The CCA-200 audiometer meets or exceeds ANSI S3.6-1989.

Dimensions:	9½" x 6¼" x 1½"
Weight:	3 lbs. with accessories
Case:	White ABS chassis
Storage Temp. Range:	0–120° F (-18–49° C)
Operating Temp. Range:	50–90° F (10–32° C)
Operating Humidity:	20–80 %, non-condensing
Test Frequencies:	500, 1k, 2k, 3k, 4k, 6k, 8kHz, crystal-controlled
Stimulus:	Continuous (1 second) or Pulsed (200ms pulse, 2.5 pulses/second)
Output Level:	-10–100 dBHL ± 3dB, 5dB step
Output Rise/Fall Time:	Not greater than 50msec, nor less than 20msec, 30msec typ.
Distortion:	Less than 3% at full output
Output On/Off Ratio:	Greater than 70dB, 95dB typ.
Transducer:	Telephonics TDH39 10-ohm earphones with MX41/AAR cushions
Power requirements:	100–240 VAC, 50–60 Hz, 3 Watts max

The CCA-200mini audiometer meets or exceeds ANSI S3.6-1989.

Dimensions:	3¼" x 5?" x 1?"
Weight:	3 lbs. with accessories
Case:	White ABS chassis
Storage Temp. Range:	0–120° F (-18–49° C)
Operating Temp. Range:	50–90° F (10–32° C)
Operating Humidity:	20–80 %, non-condensing
Test Frequencies:	500, 1k, 2k, 3k, 4k, 6k, 8kHz, crystal-

Copyright 2008 SRMi Consulting, LLC

	controlled
Stimulus:	Continuous (1 second) or Pulsed (200ms pulse, 2.5 pulses/second)
Output Level:	-10–100 dBHL ± 3dB, 5dB step
Output Rise/Fall Time:	Not greater than 50msec, nor less than 20msec, 30msec typ.
Distortion:	Less than 3% at full output
Output On/Off Ratio:	Greater than 70dB, 95dB typ.
Transducer:	Telephonics TDH39 10-ohm earphones with MX41/AAR cushions
Power requirements:	100–240 VAC, 50–60 Hz, 3 Watts max

Copyright 2008 SRMi Consulting, LLC

Trademarks

Trademark Information

The name ‘Solo’ is a trademark of Benson Medical Instruments Co. The name ‘Windows’ is a trademark of Microsoft Corporation in the United States and other countries. All other product names mentioned herein may be trademarks of their respective companies.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Warranty

Warranty

Benson Medical Instruments Co. warrants that all hardware products will be free from defects in material and workmanship for a period of one year from date of purchase. We will repair or replace, at our option, hardware that is returned freight prepaid to us during this period. You must obtain return authorization by contacting Benson Medical Instruments Co. before returning any products.

Benson Medical Instruments Co. warrants that all software products will perform substantially in accordance with these electronic instruction files for a period of one year from date of purchase. We will replace software that does not perform as described above as your sole remedy. In no case will Benson Medical Instruments Co. be responsible for damages beyond the replacement of software, or beyond the purchase price of the software.

Benson Medical Instruments Co. does not warrant these products' fitness for use for any particular application. It is your responsiblity to determine fitness for use for your particular application.

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Annual Calibration

Annual Calibration of the Audiometer

OSHA Regulation 29 CFR 1910.95 Paragraph (h) Sections (ii) and (iii) state that audiometers used for occupational testing need annual and 2-year (exhaustive) calibrations. This section of the manual will outline procedures to meet or exceed the requirements of this regulation.

This audiometer, unlike other audiometers, is controlled completely by a computer. The hardware itself has no buttons, displays, or keypads, and all testing functions are initiated by computer command. Similarly, calibration is handled by commands supplied by the computer. Hence there is no need to open the audiometer case for calibration, or even to remove the audiometer from the sound booth. This feature saves considerable time in yearly calibration as compared to units requiring considerable disassembly to access the calibration adjustments.

The audiometer software features an Automatic Annual Calibration Wizard for automatic calibration, or you can choose to do the annual calibration manually.

Access to Annual Calibration Routines

In order that operators not be able to affect the annual calibration inadvertently, access to annual calibration routines is controlled by a hardware key. The hardware key must be installed when the software or instrument is started in order to perform an annual calibration of the audiometer. While the hardware key is installed, maintenance personnel will be able to perform annual calibration and operate the instrument, but will not be able to save data or access the database.

Installing the Annual Calibration Hardware Key

The annual calibration hardware key must be installed in order to perform annual calibration of the audiometer. Refer to the procedure below.

A USB calibration key can be used. Attach it to a USB connection port.

Use the same hardware key for Sound Level Meter annual calibration.

To install the annual calibration hardware key on your computer:

1. Locate the parallel port on the back of your computer.
   This port is usually used by the parallel printer.
2. Attach the hardware key to the parallel port and hand tighten the thumb screws.
   The end of the key to be attached to the port is labeled COMPUTER.

   If you are using a parallel printer, the key is first installed on the port and the printer cable is plugged into the key. The key is designed to have no effect on the operation

Copyright 2008 SRMi Consulting, LLC

of your printer or on the operation of other keys installed on your port. More than one key can be attached at one time.

Requirements for Annual Calibration

Performance of the frequency, acoustic, and linearity measurement tests meets the annual calibration requirements of 29 CFR Part 1910.95.

Requirements for Exhaustive (2-Year) Calibration

Performance of all seven tests of automatic annual calibration (frequency, acoustic, linearity, distortion, rise/fall, on/off and crosstalk measurement) meets the exhaustive (2-year) calibration requirements of 29 CFR Part 1910.95.

Automatic Annual Calibration

For automatic annual calibration, a Larson Davis System 824 sound level meter and the annual calibration hardware key must be installed. The Larson-Davis 824 is connected to the computer by means of the Larson-Davis part CBL006 or equivalent. The audiometer should be connected as it is for normal testing.

Some of the information entered during the calibration setup, such as the technician information, will be remembered by the audiometer software and will be automatically filled in when the next calibration is performed. (Changes can be made to this information if necessary.)

The main screen for automatic annual calibration is the Audiometer Calibration Test Options dialog box, with push -buttons for each test option. ‘Run All’ will run the complete battery of tests in order to verify compliance with ANSI standards. The table below lists the test option push buttons.

Test Options
Run All
Frequency
Linearity
Acoustic
Rise/Fall
On/Off
Distortion
Crosstalk

Copyright 2008 SRMi Consulting, LLC

If you wish to see pre-calibration values before performing an annual calibration, you can run a "Pre-Cal" Acoustic test. This test does not calibrate the audiometer. Choose the Acoustic push button in the Audiometer Calibration Test Options dialog box, and choose the "Pre-Cal" radio button in the dialog box that appears.

At the end of the calibration, you will be asked to enter the serial numbers of the earphones. After this, the Audiometer Calibration Complete dialog box will appear. If the audiometer passed calibration, you can set the annual calibration date and print the calibration certificate. If the audiometer did not pass, you will not be able to set the date or print the certificate.

The procedure for automatic annual calibration is given in the next section.

Automatic Annual Calibration Procedure

To perform an automatic annual calibration:

1. From the Audiometer menu in the Control Window, choose Automatic Annual Calibration.
   The Audiometer Calibration dialog box appears.
2. Follow the on-screen instructions and choose the Next push button.
   The Audiometer Calibration Parameters dialog box appears.
3. Enter the audiometer serial number in the Audiometer Serial No. edit box.
4. In the Larson Davis 824 Port combo box, choose the serial port that the Larson Davis sound level meter is connected to.
5. Check that the entry in the Audiometer Model, which was automatically filled in, is correct.
6. In the Microphone Correction Values group box, enter the microphone correction values that were listed on the microphone's certificate of calibration.
   The edit box entry for 1000 Hz cannot be changed, since 1000 Hz is always considered to be zero.
7. Choose Next.
   The Audiometer Calibration SLM/Mic Information dialog box appears.
8. Enter the information about the sound level meter and the microphone in the appropriate edit boxes.
9. Choose Next.
   The Audiometer Calibration Technician Information dialog box appears.
10. Enter the information about the technician who is performing the calibration.
11. Choose Next.
    The Audiometer Calibration Test Options dialog box appears.
12. Choose a test, or choose Run All to run all tests.
    Follow on-screen instructions during the calibration.

Copyright 2008 SRMi Consulting, LLC

When the on-screen instructions ask you to set up the Larson-Davis 824 to obtain electrical readings, use the following Larson-Davis parts (or equivalents): 1) CBL097 cable, 2) ADP010 adapter, and 3) BNC coupler. Remove the cable connected at the top of the Larson-Davis 824 that connects the Larson-Davis 824 to the microphone coupler and pre-amp assembly. Then use the BNC coupler to attach the ADP010 adapter to the CBL097 cable. Connect the appropriate end of the CBL097 cable to the top of the Larson-Davis 824. Plug the phone jack of the ADP010 into the Left or Right connector of the audiometer, depending on which one you are testing. Connect the remaining connector of the ADP010 to the headphone.

When the on-screen instructions ask you to set up the Larson-Davis 824 to obtain acoustic readings, disconnect the ADP010 adapter from the Larson-Davis 824, and reconnect the microphone coupler and pre-amp assembly to the top of the Larson-Davis 824 using the cable provided for this purpose.

13. When the tests are complete, choose the Next push button.
    The Audiometer Calibration Phone Serial Number dialog box will appear.
14. Enter the serial numbers of the earphones in the edit boxes.
15. Choose Next.
    The Audiometer Calibration Complete dialog box appears.
16. If the audiometer passed calibration, choose the Set Annual Calibration Date push button.
    If the audiometer did not pass, you will not be able to set the calibration date or print the certificate.
17. Choose whether to print the certificate to screen using the Print to Screen check box.
    If you wish to save the certificate, choose to Print to Screen, and follow the instructions in Saving the Annual Calibration Report, below.
18. Choose the number of copies using the Copies control.
19. Choose the Print push button to print the calibration certificate.
20. Choose the Finish push button.

Saving the Annual Calibration Report

These instructions assume that Automatic Annual Calibration has just been completed. See the sections above.

To save the annual calibration report:

1. In the Audiometer Calibration Complete dialog, select the Print to Screen check box.
2. Select the Print push button.
   The Report window appears.
3. Press the export push button.
   The Export dialog box appears.

Copyright 2008 SRMi Consulting, LLC

4. Choose the appropriate format and destination.
   Depending on the format and destination you choose, the dialog boxes and choices will vary.

To view the saved annual calibration report:

1. Open the file you created in Step 4, above, using the appropriate application for that file type.

Manual Annual Calibration

The Manual Calibration dialog box is accessed by choosing the Manual button in the Annual Calibration dialog box. The manual calibration controls are described below. Choose Close to end Manual Calibration.

Group Box or Section	Control Button	Function
Ear	Left	selects the left ear
	Right	selects the right ear
Frequency Controls	Frequency	shows the frequency selected; brings up a menu of frequency values
	Higher	selects a higher frequency
	Lower	selects a lower frequency
dBHL Controls	dBHL	shows the output level; brings up a menu of dBHL values from -10 to 100
	Up	selects a higher dBHL
	Down	selects a lower dBHL
Tone Controls	Tone On	presents a tone
	Tone Off	turns off the audiometer output
Tone Types	Pulse	selects a pulse tone
	Continuous	makes the output continuous
Acoustic Calibration Controls	Up	raises the output level
	Down	lowers the output level

Calibration Options

This dialog box is for entering the Annual Calibration Warning Message. To see the Calibration Options dialog box, choose Manual Annual Calibration from the Audiometer menu in the Control Window, then choose the Options push button in the Audiometer Calibration dialog box.

Copyright 2008 SRMi Consulting, LLC

The Annual Calibration Warning is enabled or disabled in the Setup dialog box. You can set the warning to appear a certain number of days before annual calibration is due. To see the Setup dialog box, choose Setup from the Audiometer menu.

Annual Calibration Warning

To set or change the annual calibration warning for the audiometer:

1. Install the hardware key (see Installing the Annual Calibration Hardware Key).
2. Under the Audiometer menu, choose Manual Annual Calibration.
   The Audiometer Calibration dialog box appears.
3. Press the Options push button.
   The Calibration Options dialog box will appear.
4. Type your desired message in the five Annual Calibration Warning Message edit boxes.
   Each of the five boxes may contain up to 50 characters.
5. When finished, choose the OK button.

Copyright 2008 SRMi Consulting, LLC

Abbreviations

Abbreviations

The table below shows the abbreviations that are used in the audiometer software and in this instruction manual. Descriptions are given in the right column.

AN	Ambient Noise
CR	Continuous Response
dB SPL	decibel Sound Pressure Level
HC	Hearing Conservation
L	left ear
MPANL	Maximum Permissible Ambient Noise Level
MR	Multiple Response
NL	Noise Level
NR	No Response
NT	not tested
PnP	Plug and Play
PT	Presentation Timeout
R	right ear or OSHA Recordable Shift Baseline (or MSHA Reportable Shift Baseline)
Rec Shift	Recordable Shift
Rep Shift	Reportable Shift
RN	Retest Not Valid
S	OSHA STS Baseline (or MSHA STS Baseline)
SE	Subject Error
SQL	Structured Query Language
SR	OSHA STS Baseline (or MSHA STS Baseline) and OSHA Recordable Shift Baseline (or MSHA Reportable Shift Baseline)
SSN	Social Security number
STS	Standard Threshold Shift (or Significant Threshold Shift)

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Index

2

2-year calibration 235

8

8000 Hz 61

A

abbreviations 241
access levels for users 39
adding 111
audiograms 117, 118
audiometer stations 17
audiometers for daily calibration storage 136
companies 106
daily calibrations 138
Extract configurations 177
fields 204
filters 206
formats for import/export 197, 203
histories 123
languages for testing 83
Merge configurations 184
report for Multiple Report Print 91
report templates 159, 161
Select/Sorts 159, 164
subjects 111
users 40
administrators 39
level of access to software 39
setting password 13
age correction 102, 225
definition of STS with age correction 225
enabling use of 102
Alarm Off 53
description 53
keyboard shortcut 54
menu item 47
toolbar button 51
All Company List 153
ambient noise levels 70
AN Status--Ambient Noise Status 132
maximum permissible levels 67, 70
MPANLs 67, 70
Retest on Noise Above MPANL 67
Sound Level Meter 132, 221
AN Status Column 133
AN--abbreviation for Ambient Noise 133
analysis 63, 118, 125
columns for 125
during testing 63
on reports 146
annual calibration. See calibration 235
Annual Not Used 128
ASCII fields 200
ASK Function 165
ASKSYS Function 165
assigning a subject 87
Automatic Assign on Start 63
with DOHRS-HC 218

Copyright 2008 SRMi Consulting, LLC

with FOSHM 218
with HearTrak-DOS 219
with Medgate 219
with OHM 220
with Storage 87
with Systoc 220
asterisk in test display 56
Audiogram Context Menu 98
Audiogram Graph 15, 60
audiograms 117
analysis 63, 118, 125
analyzing 63, 118, 125
baseline 58, 93, 98
display on screen 56
graph 15, 60
list on screen in Storage 98
performing 88
printing 89, 145
prohibiting start 68
saving 88
transferring 215
Audiograms page on screen 97, 98, 99
Audiometer Context Menu 53
audiometers 3, 15, 53
changing configurations 17
controls 47
installing 3
setting up 15, 17
specifications 229
Automatic Assign on Start check box 63
Automatic Baseline Revision ... 102
Automatic Clear on Test Save check box 63
Automatic Retest page 70
Automatic Save on Test Complete check box 63

B

background noise 67, 70, 221
backup 171
baselines 93
Automatic Baseline Revision 102
codes in reports 146
columns in Storage 125
compared to test in real time 58
display during test 58
report containing 151
revising manually 93
revising with Automatic Baseline Revision 102
Separate Left/Right Baselines 103
setting a baseline manually 93
batch transfer using RA 500 protocol 218
Better 128
Bio-Acoustic Simulator 21, 75
bitmapped field 201

C

Calculate STS using Age Correction check box 102
calibration of audiometer ... 15, 239
enabling warning about 15
entering warning message about .. 239

Copyright 2008 SRMi Consulting, LLC

hardware key for 235
manual calibration 238
menu item 47
prohibiting testing without 68
calibration of Sound Level Meter 222
enabling warning about 15
entering warning message about .. 223
hardware key for 235
menu item 47
procedure 222
prohibiting testing without 67
care of the audiometer 227
changing. See also modifying 17
audiometer configurations 17
company of a subject 113
Subject ID format 105
clearing subjects from audiometer 51
Automatic Clear on Test Save 63
menu item 47
toolbar button 51
companies 101, 102
adding 106
All Company List 153
Company Exception List 153
Company Recordable Reportable Shift List 153
Company Recordable Shift Line Out List 153
Company Retest List 154
Company Roster report 153
Company STS Exception List 154
Company STS List 154
Company Summary report 154
Company Test Schedule List 154
deleting 107
duplicating 101, 107
modifying 101, 106
moving subjects to a different company 101, 113
settings 101
viewing 102
Company Baseline Revision 153
Company Exception List 153
Company Medical Referral List 153
Company Recordable Reportable Shift List 153
Company Recordable Shift Line Out List 153
Company Retest List 154
Company Roster 153
Company STS Exception List .. 154
Company Summary 154
Company Test Schedule List 154
confirmation of response 64
Continuous Display Update check box 221
continuous stimulus 64
Control Window 47
CR--abbreviation for Continuous Response 65
Crystal Reports 159

Copyright 2008 SRMi Consulting, LLC

D

daily calibration 75, 135
check box in Information Tab 58
menu items 50
procedure 75
reference audiogram 78
report--do not have Plus Package ... 78
reports--have Plus Package 141
storage of daily calibrations 135
Daily Calibration check box 58
Daily Calibration List report 142
Daily Calibration Summary report 142
Daily Calibration Test report 141
data transfer 215
Data Transfer between Benson Products 216
Data Transfer using a Third-Party Database 216
Data Transfer Using RA 500 Protocol 217
data validation 188, 211
for user-defined fields 211
on import 188
Database edit box 13
Database Interfaces combo box .. 16
database password 14
Database View 97, 98
databases 215
dB SPL--decibel Sound Pressure Level 221
default entries 122, 210
for user-defined fields in general .. 210
to history questions 122
Delete All 52
deleting 119
audiograms for daily calibration ... 119
audiograms for subjects 119
companies 107
Delete All 52
Extract configurations 178
filters 207
histories 124
import/export formats 204
languages 84
Merge configurations 185
report in Multiple Report Print 92
report templates 163
select/sorts 164
users 41
disabling 52
age correction 102
audiometers 52
data validation for user-defined fields 214
Prohibit Audiogram feature 67, 68
Disabling Data Validation for a Field 214
DOD Significant Threshold Shift 225
DOHRS-HC 16, 216, 218
data transfer using third-party databases 216
procedure 218

Copyright 2008 SRMi Consulting, LLC

setting as Database Interface 16
Downloading Data 215
duplicating 107
companies..... 107
Extract configurations..... 179
import/export formats 204
Merge configurations..... 185

E

employees..... 110, 111, 112, 113
Enabled--in Multiple Report Print 90
enabling 52
age correction 102
audiometers 52
data validation for user-defined fields 211
Error Log 43
errors 64, 65
data validation 188
error log..... 43
subject errors 64, 65, 211
exhaustive 2-year calibration ...235
exporting records 188
export-only fields..... 202
formats for..... 194
functions performed..... 189
overview..... 188
procedure..... 189
Extract/Merge record groups....179
extracting records.....175
configurations..... 176
Extract/Merge record groups..... 179
overview..... 175
procedure..... 175

F

fields in import/export formats.198
adding..... 204
bitmapped field..... 201
deleting..... 205
export-only fields..... 202
mapping fields 199
modifying 205
sizes of ASCII and database fields200
fields in the database.....189
bitmapped field..... 201
definitions..... 189
mapping fields 199
size in relation to size of ASCII fields 200
user-defined fields 209
fields--user-defined.....209
default entry for 210
format validation for..... 211
look-up boxes for..... 209
prompt for 210
real-time formatting..... 211
Find Subject Dialog Box.....110
First Test.....128
format validation.....211
formats for import or export....194, 196, 203
formatting data fields 199
FOSHM 16, 216, 218

Copyright 2008 SRMi Consulting, LLC

data transfer using third-party databases ... 216
procedure ... 218
setting as Database Interface ... 16

G

General tab ... 61
graph of sound levels ... 221

H

hand switch ... 3, 65
error ... 64, 65
installing ... 3
hardware key ... 19, 235
for annual calibration ... 235
for Plus Package ... 19
hearing impairment ... 126
HearTrak--DOS ... 16, 216, 219
data transfer using third-party databases ... 216
procedure ... 219
setting as Database Interface ... 16
HearTrak--Windows ... 16, 216, 219
and data transfer ... 216
procedure ... 219
setting as Database Interface ... 16
histories ... 98, 99, 119, 151
Add History push button in Save/Print ... 88
list of histories on screen ... 98
questionnaire ... 120
report ... 151
responses to questions ... 122
right-click menu ... 98
History Context Menu ... 98

I

impairment ... 126
importing ... 187, 188, 194
formats for ... 194
functions performed ... 189
overview ... 187
procedure ... 188
improvement ... 128
and persistent improvement ... 128
In Range ... 133
Initial Response Confirmation ... 64
installing annual calibration hardware key ... 235
installing audiometers ... 1
checklist ... 1
multi-station ... 6
overview ... 3
single station ... 3
software installation ... 1
installing Bio-Acoustic Simulators ... 21
installing Plus Package ... 19
installing Sound Level Meters ... 32
Instruction Language combo box ... 58
instructions--automatic ... 61, 64, 66
for start of test ... 64
for subject errors ... 64
languages--changing at testing time 58
languages--overview ... 61

Copyright 2008 SRMi Consulting, LLC

playing 66
volume of 17

K

Keep Busy 64
keyboard shortcuts 54

L

L Rec Shift 125
L Recordable Analysis 125
L Recordable Baseline 125
L Rep Shift 125
L Reportable Analysis 125
L Reportable Baseline 125
L STS Analysis 125
L STS Baseline 125
L STS Shift 125
Language combo box 58, 149
languages for Notification Letter 149
languages for voice instructions 61, 83
adding 83
changing at testing time 58
deleting 84
modifying 84
numbers assigned to in database .. 189
overview 61
setting for a test configuration 61
setting preferred language for subject 109
leading spaces 201
left pane 97
legal characters validation 212
Lock to List validation 212
log file 187, 188
look-up boxes 209

M

manual entry 118
of audiograms 118
of daily calibration reference 78
of Sound Level Meter readings 117
manual PDF file 45
manual testing 73
mapping 34
field mapping for custom formats 199
Sound Level Meters 34
Mark for Retest 47, 53
Medgate 16, 216, 219
data transfer using third-party databases 216
procedure 219
setting as Database Interface 16
medical histories 98, 119, 151
medical referral 117, 147
menus 47
at top of screen 47
right-click menu for Audiograms ... 98
right-click menu for Audiometers .. 53
right-click menu for Histories 98
right-click menu for Subjects 98
merging records 180
configurations 182
Extract/Merge record groups 179

Copyright 2008 SRMi Consulting, LLC

overview 180
procedure 181
microphone 17, 53
Missing or Invalid Data 129
modifying 112
audiograms 119
audiometer configurations 17
audiometers for daily calibration storage 139
companies 106
Extract configurations 178
filters 206
histories 124
import/export formats 203
languages 84
Merge configurations 184
Notification Letter 150
report for Multiple Report Print 92
report templates 162
select/sorts 164
subjects 112
user-defined fields 209
users 41
mounting bracket 13
mouse 54
moving subjects to different companies 113
MPANL--Maximum Permissible Ambient Noise Level 67, 70, 132
MPANLs Columns 133
MPANLs tab 70
MR--abbreviation for Multiple Response 65
MSHA 103, 225
Reportable Shift 127
Reportable Shift Baseline 127
setting MSHA as Regulation 103
STS Baseline 126
STS with age correction 225
STS without age correction 225
MSHA Reportable Shift Baseline 102
MSHA STS Baseline 126
Much Better 129
Much Worse 129
Multiple Report Print 90

N

National Hearing Conservation Association 102
NL Columns 133
NL--abbreviation for Noise Level 133
No Change 129
No Response--NR 65, 103
description of error 65
substituting a numerical value for NR 103
test of voice instruction 64
noise levels 70
Noise--message in test display ... 56
Notification Letter 149, 150
NR Substitution check box 103

Copyright 2008 SRMi Consulting, LLC

NR--abbreviation for No Response 65, 103
description of error 65
substituting a numerical value for NR 103
text of voice instruction 64

O

OHM 16, 216, 220
data transfer using third-party databases 216
procedure 220
setting as Database Interface 16
OSHA 103, 225
Recordable Shift 127
Recordable Shift Baseline 127
setting OSHA as Regulation 103
STS Baseline 126
STS with age correction 225
STS without age correction 225
OSHA Recordable Shift Baseline 117
OSHA STS Baseline 117
Other Ear First check box 58

P

pane 97
passwords 13, 39
for database on network 13
for users 39
persistence 102
and Age Correction 102
calculated only with Automatic Baseline Revision 102
Persistent Improvement 129, 131
Persistent STS 130, 132
Persistent Improvement 129
Persistent STS 130
playing voice instructions 66
Plus Package 19, 95
PnP Instrument/Serial No. Assignment 15
Print on Save 90
Print to Screen 90
printed documentation 45
printing 89
audiograms 89
changing report that prints at test end 90
daily calibration reports 78
manual PDF file 45
Multiple Report Print 90
Print on Save 90
Print to Screen 90
Procedure combo box 62
prohibiting audiogram start ..67, 68
without annual calibration 68
without daily calibration check 68
without functional check 68
without Sound Level Meter calibration 67
PT--abbreviation for Presentation Timeout 65
pulse tone 58, 64
selecting at testing time 58
selecting in Test Configuration 64

Copyright 2008 SRMi Consulting, LLC

R

R Rec Shift 125
R Recordable Analysis.....125
R Recordable Baseline.....125
R Rep Shift 125
R Reportable Analysis 125
R Reportable Baseline.....125
R STS Analysis.....125
R STS Baseline.....125
R STS Shift.....125
R--abbrev. for OSHA Recordable Shift Baseline.....146
real-time formatting 211
Rec Shift.....125
Recordable Baseline 125
Recordable STS 125, 130
Recordable STS Lined Out 130
records 118
adding.....111, 118, 123
backing up 172
deleting.....112, 119, 124
modifying 112, 119, 124
printing..... 89, 146
restoring 173
transferring 215
Refer Subject data field.....117
reference for daily calibration ..140
updating..... 78
referral--medical 147
re-formatting a field 199
Refresh menu item 47
Regulation combo box 103
Reject Audiogram check box ..117, 147
Rejected.....130
Rep Shift.....125
Repealed Recordable STS.....130
Repealed Reportable 131
Repealed STS 131
Reportable Baseline 125
Reportable Hearing Loss.....131
reports.....145
audiogram reports.....89, 145, 146
daily calibration 78
Multiple Report Print..... 90
response switch.....3, 65
and subject errors..... 65
installing..... 3
restoring records 172
Retest Not Used.....131
Retest on Noise Above MPANL check box.....67
Retest Period combo box 103
retests--entire audiograms 102, 131
and Automatic Baseline Revision 102
Retest Not Used..... 131
setting Retest Period 103
retests--of individual thresholds 67, 69, 70
automatic retests 70
programmed retests..... 69

Copyright 2008 SRMi Consulting, LLC

Retest on Noise Above MPANL 67
right pane 97
right-click menus 53, 98
RN--abbreviation for Retest Not Valid 65
roster report for companies 153

S

S--abbreviation for OSHA STS Baseline 110
Save/Print Daily Calibration dialog box 76
saving 88
annual calibration reports..... 238
Automatic Clear on Test Save..... 63
Automatic Save on Test Complete . 63
daily calibrations 76
with DOHRS-HC..... 218
with FOSHM 218
with HearTrak-DOS 219
with Medgate..... 219
with OHM 220
with Storage 88
witth Systoc..... 220
Scale of Hearing Impairment ...126
screen--updating 42
SE--abbreviation for Subject Error 65
Search All Companies check box 110
seeing.....99
audiograms 99
companies..... 102
histories 99
Information Tabs 60
Storage pane 97
work of other users 42
select/sorts 155
separate left/right baselines 103
check box 103
Server combo box 13
Set in Daily Calibration submenu 47
shortcuts 54
Significant Threshold Shift 225
simulator.....21, 75
Social Security Number ...103, 112
and Subject ID..... 103
assigning a subject using..... 87
finding a subject using 112
Sound Level Graph 221
Sound Level Meter.....221
annual calibration 222, 223
columns 132
configuring 34
display..... 221
graph 221
information tab 221
installing..... 32
mapping..... 15
Sound Level Meter group box..117
SPL--abbreviation for Sound Pressure Level.....221
Split Screen.....97

Copyright 2008 SRMi Consulting, LLC

SQL--Structured Query Language 159
SR--abbrev. for STS Baseline & Recordable Shift Baseline 110
SSN. See Social Security number 103
Standard Threshold Shift .101, 225
Start Test voice instructions 64
Status column 56
abbreviations in test display 56
Status Help box 58
Status Help 58
stimulus 64
Stop Test on Error.....66
Storage..... 15, 95, 97
choosing as Database Interface 15
features..... 95
viewing onscreen 97
Storage Features.....95
Structured Query Language 159
STS..... 58, 101, 131, 225
real-time calculation 58
STS < 6 Month 132
STS and Persistent Improvement 131
STS and Persistent STS 132
STS Baseline 102
STS L--indication in test display58
STS R--indication in test display58
Subject Averages and Impairments report 149
Subject Context Menu.....98
Subject History Questionnaire .120
Subject History. SEE histories .119
Subject ID.....103
Subject Notification Letter.....149
Subject Summary report.....151
Subject Test report.....151
Subject Test STS report 151
Subject View 97
subjects..... 109, 110, 111
adding..... 111
assigning 87
Averages and Impairments report 149
deleting..... 112
histories 119, 120, 149, 151
History Questionnaire 120, 149
IDs 103
list on screen..... 97
modifying 112, 113
moving to a different company 113
Notification Letter 149, 150
referring..... 117
Summary report..... 151
Test report 151
Test STS report..... 151
substituting a number for NR ...103
Systoc 16, 216, 220
data transfer using third-party databases..... 216
procedure..... 220
setting as Database Interface 16

Copyright 2008 SRMi Consulting, LLC

T

talk-over microphone 17, 53
Terminate Stimulus on Response (TSOR) 64
test configurations.....61, 71
available configurations 61
Test Sequence Tab--Test Configuration.....68
testing 88
automatic testing.....61
beginning a test.....88
manual testing 73
tests. SEE audiograms.....118
threshold determination--method of 62
tool tips 52
toolbar.....51
description 51
tool tips.....52
trademark information 231
trailing spaces 201
TSOR--abbrev. for Terminate Stimulus on Response 64

U

uninstalling the software 2
unique keys.....196
Update Reference push button ...76
have Plus Package 76
updating.....93
baseline audiogram.....93
daily calibration reference.....78
screen 42
user names 39
user-defined fields 209
default entry 210
format validation 211
prompt.....210
real-time formatting.....211
users.....39
access levels 39
accounts.....39
adding.....40
deleting.....41
modifying 41
network users.....41
overview.....39
setting up adminstrator.....13
viewing the work of other users 42
users manual 45

V

validation of data 188, 211
for user-defined fields.....211
on import.....188
Variable Starting Level 63
voice instructions. SEE instructions--automatic.....61, 66
volume.....17
for voice instructions 17
of microphone 17

W

Wait Intervals tab.....70
warranty.....233

Copyright 2008 SRMi Consulting, LLC

wildcard character.....199
Worse 132

Z

zero width.....97

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Audiometer Technical Training Course

Sample Calibration Forms

System Support and Service

Benson Medical Instruments Co.

CCA-200mini / BAS-200 Audiometric System

DOEHRS-HC Audiometer Refresh

SRMi Consulting, LLC

Lindor “Skip” Maletzke

(715) 276-2947

(715) 850-1568 Cell 24/7

skipm@srmi.com

Copyright 2008 SRMi Consulting, LLC

This Page is blank

Copyright 2008 SRMi Consulting, LLC

U.S. Department of Labor
Occupational Safety & Health Administration
www.osha.gov
Search GO Advanced Search | A-Z Index

Regulations (Standards - 29 CFR)

Acoustic calibration of audiometers - 1910.95 App E

Regulations (Standards - 29 CFR) - Table of Contents

• **Part Number:**	1910
• **Part Title:**	Occupational Safety and Health Standards
• **Subpart:**	G
• **Subpart Title:**	Occupational Health and Environment Control
• **Standard Number:**	1910.95 App E
• **Title:**	Acoustic calibration of audiometers

This Appendix is Mandatory

Audiometer calibration shall be checked acoustically, at least annually, according to the procedures described in this appendix. The equipment necessary to perform these measurements is a sound level meter, octave-band filter set, and a National Bureau of Standards 9A coupler. In making these measurements, the accuracy of the calibrating equipment shall be sufficient to determine that the audiometer is within the tolerances permitted by American Standard Specification for Audiometers, S3.6-1969.

(1) "Sound Pressure Output Check"

A. Place the earphone coupler over the microphone of the sound level meter and place the earphone on the coupler.

B. Set the audiometer's hearing threshold level (HTL) dial to 70 dB.

C. Measure the sound pressure level of the tones at each test frequency from 500 Hz through 6000 Hz for each earphone.

D. At each frequency the readout on the sound level meter should correspond to the levels in Table E-1 or Table E-2, as appropriate, for the type of earphone, in the column entitled "sound level meter reading."

(2) "Linearity Check"

A. With the earphone in place, set the frequency to 1000 Hz and the HTL dial on the audiometer to 70 dB.

B. Measure the sound levels in the coupler at each 10-dB decrement from 70 dB to 10 dB, noting the sound level meter reading at each setting.

C. For each 10-dB decrement on the audiometer the sound level meter should indicate a corresponding 10 dB decrease.

D. This measurement may be made electrically with a voltmeter connected to the earphone terminals.

(3) "Tolerances"

When any of the measured sound levels deviate from the levels in Table E-1 or Table E-2 by + or - 3 dB at any test frequency between 500 and 3000 Hz, 4 dB at 4000 Hz, or 5 dB at 6000

Copyright 2008 SRMi Consulting, LLC

Hz, an exhaustive calibration is advised. An exhaustive calibration is required if the deviations are greater than 15 dB or greater at any test frequency.

TABLE E-1 - REFERENCE THRESHOLD LEVELS FOR TELEPHONICS - TDH-39 EARPHONES

Frequency, Hz	Reference threshold level for TDH-39 earphones, dB	Sound level meter reading, dB
500	11.5	81.5
1000	7	77
2000	9	79
3000	10	80
4000	9.5	79.5
6000	15.5	85.5

TABLE E-2 - REFERENCE THRESHOLD LEVELS FOR TELEPHONICS - TDH-49 EARPHONES

Frequency, Hz	Reference threshold level for TDH-49 earphones, dB	Sound level meter reading, dB
500	13.5	83.5
1000	7.5	77.5
2000	11	81.0
3000	9.5	79.5
4000	10.5	80.5
6000	13.5	83.5

Next Standard (1910.95 App F)

Regulations (Standards - 29 CFR) - Table of Contents

Back to Top http://www.osha.gov/index.html http://www.dol.gov/

Contact Us | Freedom of Information Act | Customer Survey
Privacy and Security Statement | Disclaimers

Occupational Safety & Health Administration
200 Constitution Avenue, NW
Washington, DC 20210

Copyright 2008 SRMi Consulting, LLC

Navy and Marine Corps Public Health Center
Calibration Laboratory
Certificate of Audiometer Calibration

SUBMITTING ACTIVITY	TECHNICIAN	DATE
MANUFACTURER	MODEL	SERIAL NUMBER

**CALIBRATED PER ANSI S3.6-1989*

FREQUENCY (Hz)	S.P.L LEFT E/ R @70dB			TDH 39/49-50	S.P.L RIGHT EAR @ 70dB		BONE CONDUCTION			LINEARITY @6000hz	
req'd	final	rcv'd	error	norm	rcv'd	error	norm	final	error		
125				115.0/**						100/	40/
250				95.5/96.5			65.5			95/	35/
500				81.5/83.5			79.7			90/	30/
750				77.5/79.0			67.5			85/	25/
1000				77.0/77.5			63.2			80/	20/
1500				76.5/77.5			60.6			75/	15/
2000				79.0/81.0			53.7			70/	10/
3000				80.0/79.5			44.2			65/	05/
4000				79.5/80.5			48.2			60/	00/
6000				85.5/83.5						55/	-05/
8000				83.0/83.0						50/	-10/
										45/	

Inspection	Pass	Fail
Other Unwanted Sound		
Tone, Rise, Decay, Overshoot		
Sound from Second Earphone		
Purity of Tones		
Distortion		

Remarks_____

Job Number_____ Date_____ Technician_____

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Certificate of Audiometer Calibration

THIS IS TO CERTIFY THE _____
SERIAL NUMBER AS SHOWN ON THE REVERSE SIDE, WAS CALIBRATED
ON _____ ___, 20_____

FOR

_____

_____

_____

THE ABOVE INSTRUMENT COMPLIES WITH
THE AMERICAN NATIONAL STANDARD INSTITUTE SPECIFICATION FOR
AUDIOMETERS - ANSI S3.6-1996 OR EARLIER, AS SHOWN
ON THE REVERSE SIDE OF THIS CERTIFICATE.

ANSI CERTIFICATION
EXPIRES ON

_____

CALIBRATED BY:
LINDOR R. MALETZKE, III
PRINCIPAL MEMBER

_____

SRMi
Consulting, LLC
P.O. BOX 190
MOUNTAIN, WI 54149
(800) 356-5239
SKIPM@SRMI.COM

Copyright 2008 SRMi Consulting, LLC

CALIBRATION CERTIFICATE

AUDIOMETER MANUFACTURER: _____ MODEL: _____ SERIAL #: _____

CALIBRATION DATE: / / EXPIRATION: / /

CH 1	FREQ	DIST	Rise/Fall		CH 2	FREQ	DIST	Rise/Fall		Snd Rm
500					125					
1000					250					
2000					750					
3000					1500					
4000					Probe					
6000					Ipsi					
8000					Contra					

	LEFT		RIGHT			LEFT		RIGHT		
CH 1	PRE	POST	PRE	POST		PRE	POST	PRE	POST	mm H20
500					125					
1000					250					
2000					750					
3000					1500					
4000					Probe					
6000					Ipsi					
8000					Contra					

Attentuator Linearity														
00	05	10	15	20	25	30	35	40	45	50	55	60	65	70
														REF
70	75	80	85	90	95	100	105	110	on/off		opp phn		attn pad	
REF									CH 1	ch 2	ch 1	ch 2	ch 1	ch 2

Copyright 2005 - SRMi Consulting, LLC – All rights reserved worldwide

Audiometer Calibration Date: 8/28/2008

Audiometer:

Audiometer Model:	CCA-200m
Audiometer Serial Number:	60338
Left Phone Serial Number:	C404682
Right Phone Serial Number:	C404690
Last Calibration Date:	7/ 3/2008

Instrumentation:

SLM Mfg/Model:	Larson Davis System 824
SLM Serial Number::	A3847
SLM Calibration Date:	3/24/2008
Microphone Mfg/Model:	2575
Serial Number:	1874
Mic Calibration Date:	3/24/2008

Calibration: Calibration conforms to ANSI S3.6-1989

	Left				Right		
	Freq (Hz)	Pre-cal (dB HL)	Post-cal (dB HL)	THD (dB)	Pre-cal (dB HL)	Post-cal (dB HL)	THD (dB)
500Hz:	500	70.1	70.2	-46.0	65.3	69.7	-46.7
1kHz:	1000	70.0	70.0	-57.0	64.2	69.6	-55.3
2kHz:	2000	70.0	70.0	-46.9	64.9	70.3	-47.7
3kHz:	3000	70.6	70.5	-56.4	64.4	70.4	-53.5
4kHz:	4000	70.5	70.5	-54.8	69.5	69.5	-50.1
6kHz:	6000	70.2	70.1	-51.0	69.7	69.9	-51.0
8kHz:	8000	69.9	70.0	-48.6	70.0	70.0	-48.4

Linearity:

Left		
Level (dB HL)	Step Error (dB)	Total Error (dB)
100.6	0.0	0.1
95.6	0.1	0.1
90.5	0.0	0.0
85.5	0.0	0.0
80.5	0.0	0.0
75.5	0.0	0.0
70.5	0.0	0.0
65.5	0.0	0.0
60.4	0.1	0.1
55.4	0.0	0.1
50.4	0.0	0.1
45.4	0.0	0.1
40.4	0.0	0.1
35.4	0.0	0.1
30.4	0.0	0.1
25.4	0.0	0.1
20.4	0.0	0.1
15.4	0.0	0.1
10.4	0.0	0.1

	Rise (mS)	Fall (mS)	OS (dB)
500Hz:	38.0	30.0	0.1
1kHz:	38.5	30.0	0.0
2kHz:	38.0	30.0	0.0
3kHz:	38.5	30.0	0.0
4kHz:	38.5	30.0	0.0
6kHz:	38.5	30.0	0.0
8kHz:	38.5	30.0	0.0

On/Off Ratio:	104.0	dB
Crosstalk:	105.3	dB

Calibrated by:

Skip Maletzke
SRMi Consulting, LLC
PO Box 190
Mountain, WI 54149
800-356-5239

Remarks:

Technician Signature Date

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

Audiometer Technical Training Course



Calibration Systems

System Support and Service

Benson Medical Instruments Co.

CCA-200mini / BAS-200 Audiometric System

DOEHRS-HC Audiometer Refresh

SRMi Consulting, LLC

Lindor “Skip” Maletzke

(715) 276-2947

(715) 850-1568 Cell 24/7

skipm@srmi.com

Copyright 2008 SRMi Consulting, LLC

This Page is blank

Copyright 2008 SRMi Consulting, LLC

Sound Level Meter and Real-time Analyzer

- Advanced Sound Level Measurements – Real-time 1/1, 1/3 Octave
- Building Acoustics Measurements
- Real-time FFT Analysis
- Environmental Noise Monitoring – Transient Event Measurements
- Audiometer Calibration



The Larson Davis System 824 combines advanced sound level meter and real-time analyzer capabilities into a rugged, user-friendly, ergonomic package. The base unit is an Integrating Sound Level Meter (ISM) that meets Type 1 Standards and offers simultaneous measurement of sound pressure levels using fast, slow, and impulse detectors, for A, C, and flat frequency weightings. This feature, termed ANY LEVEL™ measures 48 sound pressure parameters at once with a linear, 105 dB range. With firmware enhancements, the base unit expands as needed to accommodate multiple data processing requirements, including:

• Sound Spectrum Analyzer (SSA) with ANY LEVEL™ simultaneous sound pressure level measurement, real-time 1/3 octave frequency analysis, spectral Lns and multiple time histories. This is your "do everything at once" instrument.

• Real-time Frequency Analyzer (RTA) provides rapid storage of 1/3 octave spectra at rates to 400/second, advanced trigger functions and automated determination of reverberation time.

• Fast Fourier Transform Analyzer (FFT) with 400-line resolution from 1 Hz to 20 kHz for specific frequency investigations. Includes snapshot data storage, THD calculations, user definable linear units, and more.

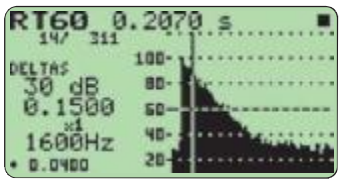
• Logging Sound Level Meter (LOG) provides advanced time and data logging features, including automatic logging of data associated user-defined noise events.

As with all Larson Davis products, this equipment is complemented with toll free applications assistance, 24-hour customer service, and is backed by a no-risk policy that guarantees satisfaction or your money refunded.

Larson Davis
A PCB PIEZOTRONICS DIV.

Copyright 2008 SRMi Consulting, LLC

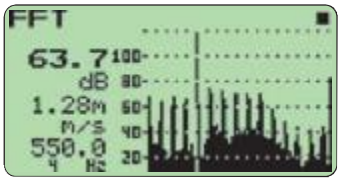
High Speed Real-time Frequency Analysis (RTA)



Provides acquisition of 1/1 or 1/3 octave spectra at rates up to 400/sec. Use advanced triggering to initiate acquisition based on exceedance of a threshold sound level or, for room acoustics, based on impulse excitation or decay of broadband sound in a room. Automatically capture and average decay spectra for multiple measurement sequences. Use with DNA software to calculate RT-60 using Schroeder backwards integration and to determine building acoustics parameters such as transmission loss and impact isolation according to ISO and ASTM standards.

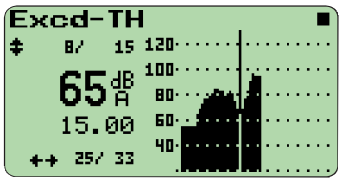
Easily determine speech interference level (SIL) and RC, NCB and HTL room criteria as defined by ANSI S12.2-1995 from single or averaged spectra.

Fast Fourier Analyzer (FFT)



When greater frequency determination is required, this feature offers 400-line FFT analysis with upper frequency bands adjustable from 200 Hz to 20 kHz. With selectable time windows (Hanning, rectangular, and flat top), flexible averaging and user defined linear units showing the actual input voltage, the System 824 provides a lot of versatility in a hand held FFT analyzer. A full range of accessories allows you to quickly interface with accelerometers or direct signals to measure vibration levels, frequency or even total harmonic distortion (THD). Additionally, there are snapshot data storage and display zoom with a factor of 2, 4, or 8.

Logging Sound Level Meter (LOG)



Ideal for unattended noise monitoring. Up to 39 ANY LEVEL™ parameters may be logged in time steps as short as 1/32 second. Log basic sound levels, Ln's, spectral Ln's and frequency spectra in intervals as short as 1 second. Log noise event data (levels exceeding user-defined thresholds) including date/time, duration, Leq, Lmax, Lmin, Lpeak along with event Time History. Log 24-hour community noise criteria Leq, Ldn, Lden and CNEL. Using external transducers, measure and log Wind Speed (average/maximum) and Wind Direction data with an inhibit feature to stop accumulation of sound level data during periods of high wind speed (user-defined).

Environmental Noise Monitoring Systems



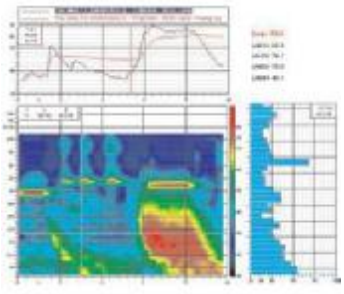
Larson Davis provides an extensive range of accessories for short or long term noise monitoring including outdoor microphone systems with electrostatic calibration, microphone protective shrouds, modems, weatherproof cases with batteries and connections for computers, solar power systems, tripods of various sizes and tilt-down poles for permanent noise monitoring.



Building Acoustics

The SRC20 Noise Source is a battery powered Digital Signal Generator that is ideal for building acoustics and electroacoustics testing, providing sine, swept sine, pink, and white noise signals.

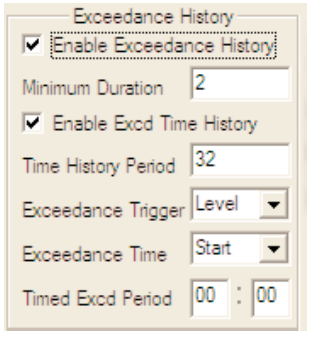
Data, Navigation and Analysis Software



DNA-824 software provides communication with remote instruments, extensive analysis, and top notch presentation features. Linked cursors, live spectrograms, and event capture are all available. Drag and drop 824 data onto report templates customized with your logo and other information. Perform instantaneous, automatic capture of .wav files — an ideal way of annotating graphical data with an actual sound clip of the noise event! Data can also be streamed to a PC's hard disk for long term unattended measurements.

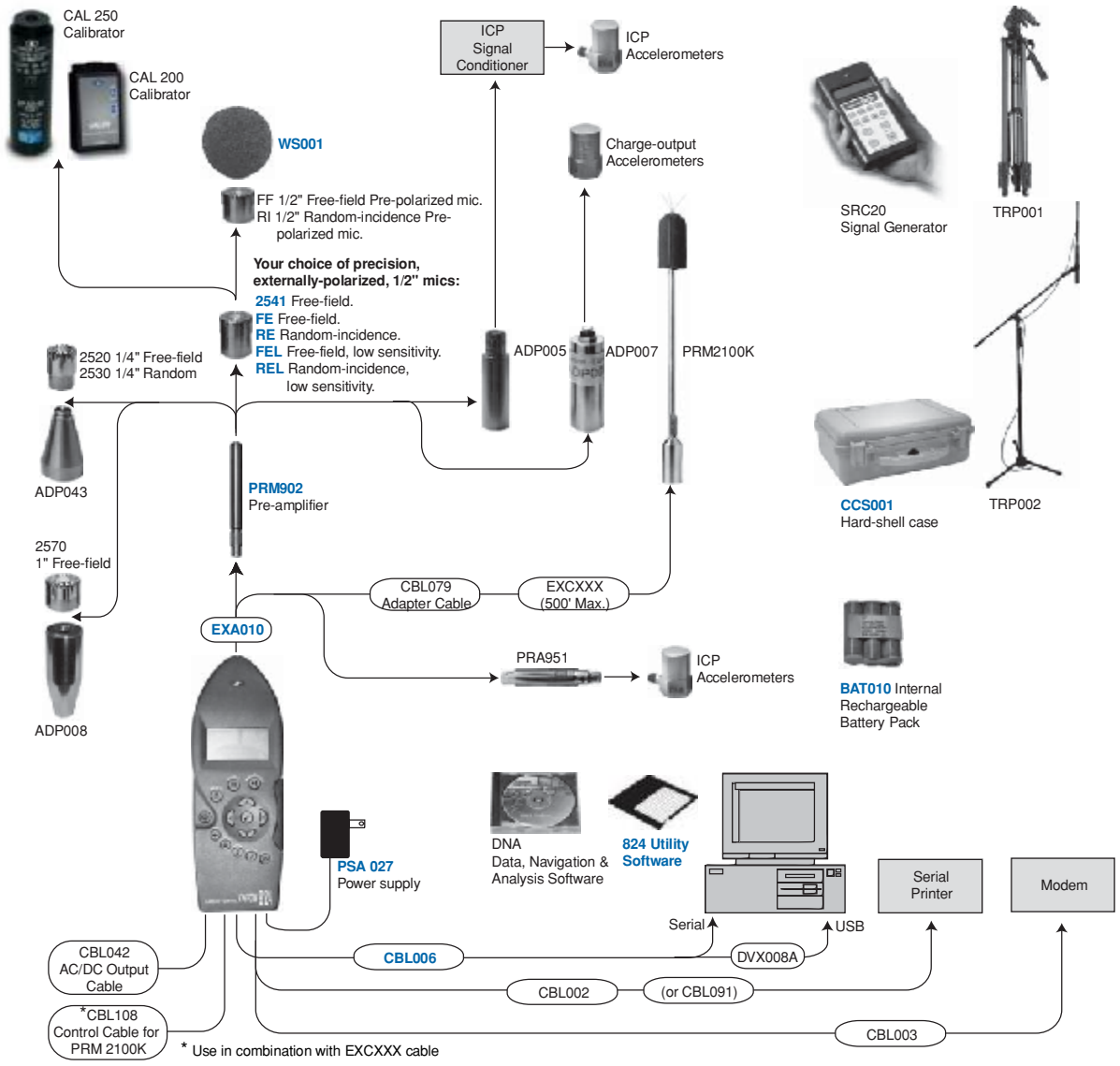
DNA is loaded with analysis tools for building acoustics, sound power, environmental noise measurement, noise mapping, etc. After using DNA, you will agree that it is the single most powerful software available for any sound level meter.

824-Utility: Free, powerful software for the 824



Create, store and upload instrument setups. Download measurement files and view text and numerical data collected on the 824. Export history, event and spectral data to spreadsheets and text files. Connect using serial or USB (adaptor DVX008A required).

Copyright 2008 SRMi Consulting, LLC



NOTE: Items in blue type are included accessories

The 824 is available in the following configurations:

Model	Description	ISM	LOG	SSA	ACC
824S	Type 1 SLM with 1/2" Mic, PRM902, WS001	✔			
824L	Type 1 SLM with 1/2" Mic, PRM902, WS001, includes accessories	✔	✔		✔
824A	Type 1 SLM with 1/2" Mic, PRM902, WS001, includes accessories	✔		✔	✔
824	Type 1 SLM with 1/2" Mic, PRM902, WS001, includes accessories	✔	✔	✔	✔

At any time, your 824 can be upgraded with these options:

Options	Description	824S	824L	824A	824
824-LOG	Logging capability	✔		✔	
824-SSA	Sound spectrum analysis capability	✔	✔		
824-ACC	Accessories: CCS001, CBL002, CBL006,CBL042, BAT010, EXA010, PSA026, 824-Util	✔			
824-RTA	Real-time analysis capability option with fast autostore, RT60, noise criteria	✔	✔	✔	✔
824-FFT	Narrow band, 400-line FFT option	✔	✔	✔	✔

Copyright 2008 SRMi Consulting, LLC

System 824 Features and Specifications

General

Time weighting:	Slow, Fast, Impulse, TWA, peak (in parallel with all frequency weightings)
Frequency weighting:	A, C, Flat (in parallel with all time weightings)
Linearity range:	>105 dBA (ISM & LOG), >80 dB (SSA)
RMS noise floor:	<16 dBA (2541 microphone), typical
RMS overload level:	157 dBA (2540 microphone), typical
Peak range:	>65 dB
Peak level:	160 dB (2540 microphone)
Octave band frequencies:	1/3 octave: 12.5 Hz to 20 kHz 1/1 octave: 16.0 Hz to 16 Hz
400-line FFT:	1 Hz to 20 kHz

Measurements

SPL:	A, C, Flat for Slow, Fast and Impulse
Lmin:	A, C, Flat for Slow, Fast and Impulse
Lmax:	A, C, Flat for Slow, Fast and Impulse
Lpeak:	A, C, Flat
Leq :	A, C, Flat
SEL:	A, C, Flat
TAKT3 & TAKT5:	A, C, Flat for Slow, Fast
Additional metrics:	TWA, SE, Dose, Projected Dose, C minus A
Real-time 1/3 octave frequency analysis:	Six Ln values (user selectable), Leq, @max, Lmin spectra with 1/3 or 1/1 display, six spectral Ln's (overall or interval)

Memory

2 Megabytes of memory sufficient to store any one of the following:

- 2 million point time history (1.0 dB resolution)
- 1 million point time history (0.1 dB resolution)
- 70,000 RTA 1/1 octave spectra
- 60,000 LOG intervals without Ln's
- 35,000 LOG intervals with Ln's
- 28,000 point 1/3 octave SSA Leq time history
- 28,000 RTA 1/3 octave spectra
- 20,000 intervals with 1/3 octave Leq spectrum
- 12,300 SSA intervals with Leq and Max 1/3 octave spectra
- 2,400 FFT 400-line snapshots

Communications Interface

USB (with DVX008A USB to DB9M Serial Adaptor) RS-422/RS-232 serial interface; modem mode

Display/Keypad

Large backlit true bit-mapped graphic display (64 x 128 pixels)

14 backlit silicone rubber sealed keys with icons and silent operation

Power

Internal:

- Battery power: NiMH pack (provided) or 3 AA cells (NiMH, Photo Lithium or Alkaline)
- Operating Time: up to 7 hours of operation (battery type and mode dependent)
- Internal smart charger

External:

- Voltage range: 6 to 15 Vdc
- Typical current: 150 mA@12 Vdc

Physical Characteristics

Dimensions (length x width x depth):	9.9 x 3.4 x 1.6 in (251 x 86 x 41 mm) excluding preamplifier
Weight (excluding microphone and preamplifier):	1.1 lb (0.53 kg)

Environmental

Operating Temperature:	+14 to +122 °F (-10 to +50 °C)
Storage Temperature:	+14 to +140 °F (-10 to +60 °C)

Standards Compliance

IEC61672-1 (2002) Class 1

IEC60804 (1985) Type 1

IEC60651 (1993)

IEC61260 (1995) Class 1

ANSI S1.4 – 1983

ANSI S1.11 – 1985 – Type 1D

CE Indicates compliance with EMC Directive and Low Voltage Directive

824 Optional System Configurations

824-SSA:	Upgrades 824 S or 824L to sound spectrum analysis capability
824-LOG:	Upgrades 824S or 824A to logging capability
824-FFT:	Adds 400-line FFT analysis to any 824
824-RTA:	Adds RTA module for spectra autostore, RT60's, NC and RC to any 824
824-AUD:	Firmware for audiometer calibration and total harmonic distortion measurement
824-WND:	Firmware to enable logging of wind speed and direction (or tachometer reading)
824-RTA/FFT:	Adds both RTA and FFT modules to any 824
824-ACC:	Adds standard accessories package to 824S (CCS001, CBL006, CBL042, BAT010, EXA010, PSA026, 824-UTIL)

824 Accessories (included with 824L, 824A and 824)

Documentation:	Users and Training Manual
Choice of 1/2" microphone:	2540, 377B41, 377A60, 377A01
PRM902:	Microphone preamplifier
*CBL06:	Serial computer interface cable
*WS001:	3-1/2" windscreen
*PSA027:	Universal AC power adaptor, 12 volt output
*BAT010:	NiMH rechargeable battery pack
*CCS001:	Hard shell carrying case
*EXA010:	Ten foot microphone extension cable
*824 UTIL:	Windows based software for instrument setup, data download and data export

* Not included with 824S

824 Accessories (optional)

SRC20:	Stand-alone hand-held signal and noise generator
PSA024:	External battery charger for BAT010
Software:	DNA Data, Navigation and Analysis software
DVX008A:	USB to DB9 Serial Adaptor
CBL002:	Serial printer cable with 25 pin male 'D" connector
CBL003:	Serial modem cable with 25 pin male 'D' connector
CBL091:	HP serial printer cable with 9 pin male 'D' connector
MDM001:	Battery powered telephone modem
MDM012:	AC powered telephone modem
MDM010:	Radio frequency modem
Acoustic calibrators:	CAL200, CAL250
Outdoor environmental cases:	EPS024, EPS026, and EPS028
Environmental protection for microphones and preamplifiers:	EPS2106, 2107 and 2108
Outdoor preamplifier for long-term noise monitoring with electrostatic actuator:	PRM2100K
Tripod/Microphone Boom:	TRP001/TRP002
Microphone extension cables:	EXAxxx (where "xxx" is length in feet; standard cable lengths, in feet, include: 1.5, 6, 10, 20, 25, 35, 50, 66, 100 and 200)

Total Customer Satisfaction Guaranteed

Larson Davis, Inc.
3425 Walden Avenue, Depew, NY 14043-2495 USA
Toll Free: 888-258-3222 Phone: 716-926-8243 Fax: 716-926-8215
Email: sales@LarsonDavis.com www.LarsonDavis.com
ISO 9001:2000 CERTIFIED

Larson Davis
A PCB PIEZOTRONICS DIV.

ICP is a registered trademark of PCB Group, Inc. All other trademarks are property of their respective owners.
In the interest of constant product improvement, specifications are subject to change without notice.

© 2006 Larson Davis, Inc. All rights reserved. Printed in U.S.A.

LD-824-0606/D0500.0003 Rev E

Larson Davis provides a complete line of acoustic and vibration measurement tools including dosimeters, sound level meters, real time analyzers, pre-amplifiers, calibrators, and microphones.

Copyright 2008 SRMi Consulting, LLC

AUDit™ & System 824

Audiometer Calibration and Electro-acoustic Test System

Larson Davis

A comprehensive line of couplers, systems and software!

Larson Davis audiometer calibration systems combine the speed and power of the System 824 real time analyzer with the sophisticated, yet user-friendly, AUDit™ software. Standard audiometer specification tests can be performed manually or under computer control with greater ease than with any other system.

To interface with the large variety of audiometer transducers, the Larson Davis family of couplers includes NBS 9-A and IEC 318 couplers as well as an extremely practical artificial mastoid.

Finally, there is a rugged, portable solution for in-house or in-field audiometer calibration which sacrifices none of the accuracy and stability of laboratory instrumentation.

1. **Verify audiometers quickly and accurately under computer control** with exhaustive tests based on the ANSI S3.6-1996 *Specification for Audiometers* limits

2. **Test nearly every type of transducer** such as supra-aural, extended range circumaural, bone vibrator, hearing aid, insert earphone, and speaker

3. **Automatically correct** RETSPLs, microphone, coupler, and all other response adjustments using AUDit™ software

4. **Perform level and frequency adjustments** during audiometer tests

5. **Qualify audiometric booth ambient noise** with real time 1/3 octave analysis and fast pass/fail results for ANSI S3.1-1991

6. **Store and recall tests in databases;** query databases by audiometer, technician, date, etc.

7. **Print custom reports and certificates** for your customers or for your own archives

Research & Development
- Audiometer design and testing
- Earphones and hearing aids
- Electro-acoustic testing

Industrial Hygiene
- Audiometer certification
- Clinics and hospitals
- Hearing protection programs



System 824: Electro-acoustic analyzer and precision SLM

Level, frequency, FM, and pulse measurements are only a small portion of the capabilities of the System 824 real time analyzer.

Narrow-band FFT and real time 1/3 octave analysis speed up measurements such as THD or ambient noise measurements.

Since the 824 is a complete, hand-held precision sound level meter, it is also well suited for:

- measuring noise dose exposure
- performing environmental noise studies
- assisting in noise reduction engineering

Copyright 2008 SRMi Consulting, LLC

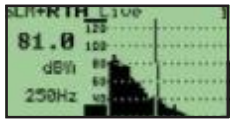
The perfect integration of analyzer, software and couplers for fast, exhaustive testing

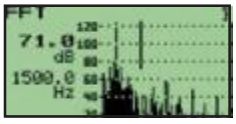
The 824-AUD Firmware provides internal audiometer testing functions

Larson Davis audiometer calibration systems owe their power to the precision System 824 sound level meter: its standard real time fractional octave filters are important for audiometer tests. The 824-AUD firmware is also loaded with additional features such as FM and pulse, 400-line FFT for narrow-band analysis and total harmonic distortion, etc.

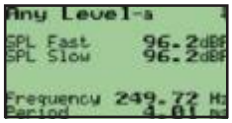
Real time analysis for HL, frequency & THD

Hearing level measurements are simple with the real time 1/3 octaves of the System 824. The full spectrum is displayed without having to change filters. The 400-line FFT mode displays smaller frequency bands to locate and measure harmonics for THD measurements.





A precision counter accurately samples the period of the tone stimulus and displays it along with frequency.



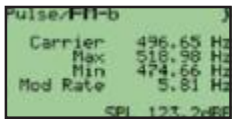
All pulse measurements on a single screen

When pulsed stimulus capability must be tested, simply present the tone and read all values on a single screen of the System 824. Rise, Fall, ON and OFF times are measured with millisecond accuracy. Plateau duration and overshoot level are also averaged and displayed on the same screen.



Test frequency modulated stimuli

The characteristics of the FM presentation can be assessed just as easily. The System 824 measures minimum and maximum frequencies, calculates the carrier frequency and also measures the modulation rate.



AUDit™ Software offers test management, audiometer database, and reporting

An audiometer calibration involves much mundane but time consuming (and possibly error prone) note-taking and calculation. The AUDit™ software has been designed to simplify those steps and streamline testing.

Complete test information and definition

Measurement system: keeping track of test equipment is easy as the software maintains a database of your calibrators, microphones, couplers and 824 SLM with model, serial number and calibration date information.

Audiometer description: enter a complete description of the tested audiometer, its capabilities (such as type and frequencies), and its transducers. Future tests can recall this configuration.

Level corrections: these are done automatically from entered microphone, coupler and other responses.

Perform exhaustive calibrations

Ambient (booth) noise level test: the ambient noise of an audiometric test must not affect the patient. LD has integrated this standard test in AUDit™. Simply calibrate the microphone, then start the test. Failed frequencies are reported with a large red X.

Speaker tests, visual inspection: these are only two of the many tests that are available. Tests can recall the audiometer configurations and test instrumentation from previous calibrations.

Perform all, or select only desired tests: the main measurement screen displays a selection of tests, as well as their current status. Once a test is selected, simple prompts indicate what stimulus is required. Adjustments can be made immediately in some tests!



Generate results, reports and certificates

Results: each test displays immediate results on screen, with measured data and standard limits. It is possible to retest each failed frequency, level or function.

Custom reports and certificates: any stored calibration may be printed in whole or part. A certificate can also be printed, with your own customized certification text.

Export from database: should you desire even more flexibility, test results can be exported to your own template as .csv files.

Copyright 2008 SRMi Consulting, LLC

AMC493 Artificial Mastoid

Use this innovative transducer for no-fuss bone vibrator testing

The LD AMC493 artificial mastoid is a precision mechanical coupler used to calibrate bone conduction hearing aids and audiometer bone vibrators.



The AMC493 is cost effective and simple to use. Its patented design converts the vibrator velocity output to an acoustic signal measured with the system's sound level meter. It is integrated with the AEC100 artificial ear to perform both ear and bone conduction tests using essentially the same equipment.

The AMC493 has an extremely low thermal mass compared to mastoids that require hours to reach the 23°C calibration temperature recommended in the standard. The AMC493 is ready for use within minutes! Put it in your pocket, instead of hitting your knees carrying a heavy case.

While polymers used in other mastoids are affected by aging and environmental exposure, the AMC493 polymeric parts are completely replaced each year during its inexpensive calibration and certification.

COMPONENTS	DESCRIPTION
AMC493:	Artificial mastoid coupler (use with LD AEC100)
SPECIFICATIONS	
Frequency range:	125 Hz - 8 kHz, individually calibrated
Static force:	5.4 N with added mass ring
Materials:	Black anodized, laser etched aluminum disk with polymeric inserts, stainless steel mass
Dimensions:	0.3" H x 1.2" dia. (7mm H x 30mm dia.)
Weight:	0.3 oz. (8.7 g), coupler only

AEC101 IEC318 Coupler

An optional coupler for extended frequency earphone testing

Circumaural earphones are often used in modern audiometers offering stimuli at frequencies higher than 8000 Hz. The LD AEC101 IEC 318 coupler better represents high frequency earphone to ear coupling and is therefore indicated in ANSI and other standards for testing circumaural earphones.

The AEC101 is supplied with accessories to test extended frequencies on earphones such as the Koss HV1/A and Sennheiser HDA200, as well standard frequencies on TDH series earphones. Weights and plates for all supported earphone types are neatly packaged in a light, weather-tight case.



COMPONENTS	DESCRIPTION
Microphone:	2559 1/2" random incidence (not included)
Preamplifier:	PRM902 1/2" dia. low noise preamp (not incl.)
AEC101.F:	IEC 60318-1 coupler
MAEC101.06:	Type 1 adaptor plate
MAEC101.07:	Type 2 adaptor plate
MAE100.6:	Earphone retaining ring
Static Force:	4.5 N standard, 9.5 N bag for circumaural earphones
ACC001:	Vibration isolation pillow
CCS002:	Fiberglass reinforced weather-tight case
SPECIFICATIONS	
Materials:	Stainless steel base and coupler cavity, Delrin® conical ring, aluminum plates and retainer ring
Pressure leak:	Custom precision orifice
Dimensions:	2.2" H x 3.2" dia. (56mm H x 81mm dia.)
Coupler weight:	3.2 lbs (1.4 kg)

AEC100 NBS 9-A Coupler

A rugged instrument for testing TDH earphones

The AEC100 Coupler is a precision acoustic coupler designed primarily for the calibration and test of supra-aural earphones used in audiometry.
It allows accurate and repeatable measurements within its frequency response (up to 8 kHz). It may also be used for production testing where correlation between the coupler and real ear response is not a requisite.



COMPONENTS	DESCRIPTION
Microphone	2575 1" pressure mic (not included)
Preamplifier	PRM902 1/2" dia. low noise preamp (not incl.):
MAE100.1:	NBS 9-A coupler
SP-MAE100.40:	Coupler base
MAE100.3:	Protective cap
MAE100.6:	Earphone retaining ring
Static Force:	4.5 N mass and handle
ACC001:	Vibration isolation pillow
SPECIFICATIONS	
Materials:	Stainless steel base, coupler & mass, alum. ring
Diameter:	3.2" (82 mm) max
Height:	2.5" (64 mm) 4.4" (110 mm with ring)
Weight:	5.5 lbs (2.5 kg)

Listen with Larson Davis

Copyright 2008 SRMi Consulting, LLC

Ready to use systems or custom configurations

Larson Davis has a solution for your audiometer or electro-acoustic test

The following systems are configured for exhaustive audiometer testing. The SYS008 consists of software, a System 824 precision analyzer, and AEC100 coupler for certification of audiometers with supra-aural earphones. If you calibrate audiometers with bone vibrators, the SYS009 also includes the AMC493 artificial mastoid. Call Larson Davis to configure your own system – substitutions allowed!

SYS008 Audiometer Calibration System

824	Precision SLM / real time analyzer
AUDit™	Powerful test and reporting software
AEC100	NBS 9-A coupler
CAL250	Acoustic calibrator
2575	1" pressure air condenser microphone
EXA010	10 ft. extension cable
CCS007	Airtight insulated custom fiberglass case
Adaptors	For electrical and ambient noise testing

SYS009 Audiometer Calibration System with AMC493

824	Precision SLM / real time analyzer
AUDit	Powerful test and reporting software
AEC100	NBS 9-A coupler
AMC493	Artificial mastoid for bone vibrator test
CAL250	Acoustic calibrator
2575	1" pressure air condenser microphone
EXA010	10 ft. extension cable
CCS007	Airtight insulated custom fiberglass case
Adaptors	For electrical and ambient noise testing

Features & Specifications

Measurements and Features	
Hearing level, linearity:	Test / adjust user selected frequencies and levels with prompts, out-of-tolerance indication
Frequency accuracy:	Precision counter averages readings of audiometric or extended frequencies
Pulse measurements:	Simultaneous test of pulsed stimulus: rise, fall, on and off times, on/off ratio and width
Frequency modulation:	Minimum, maximum frequencies, % modulation and repetition rate at all test frequencies
Total harmonic distortion:	Hands-off test of THD using FFT analysis reports fundamental and harmonic levels, % THD
Narrowband, broadband:	Narrowband stimulus level, % modulation and repetition rate test at all test frequencies
Speech, crosstalk:	Microphone, tape / CD output signal test or speech noise test, as well as crosstalk
Bone vibrators:	Hearing level and other tests for forehead or mastoid placement using AMC493 or B&K mastoid
Earphones:	RETSPLs and couplers for supra-aural (eg TDH 39, 40, 50), circumaural (eg HDA200, HV1/A), software compatibility with transducers such as in-the-ear or insert, IEC 711, HA-1 or HA-2 couplers
Speakers:	Automated tests with binaural or monaural (0, 45 or 90° placement of speakers)
Ambient noise:	Audiometric test / hearing aid fitting area allowed background noise test by 1/3 octaves
System 824 Precision Analyzer	
General:	Precision (Type 1) SLM with A,C,Flat weight, >80/105 dynamic range, int/ext power, 2MB, 824-AUD firmware, low-noise 1/2" preamp, NiMH battery, RS232 and printer cables
Frequency analysis:	1/1 octave: 16-16kHz, 1/3 octave: 12.5-20kHz, narrowband FFT: 400 lines 1,2,5,10,20 kHz
2575 microphone:	Precision 1" pressure response condenser compatible with AEC100 coupler
CAL250 calibrator:	114.0 dB (re 20 micropascals), 250 Hz +/- 0.5 Hz, one inch opening, 1/2" adaptor ADP019
Governing Standards	
AUDit™ software:	ANSI S3.6-1996 Specification for Audiometers, ANSI S3.7-1995 Methods for Coupler Calibration of Earphones, ANSI S3.1-1991 Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms
System824 SLM/RTA:	ANSI S1.4-1983 –Type 1, ANSI S1.11-1986 – Type 0C, IEC 60651 and 60804 –Type 1, IEC 61260 – Class 1, PTB approved
AEC100 coupler:	ANSI S3.7-1995 Methods For Coupler Calibration Of Earphones, IEC 60318-3
AEC101 coupler:	ANSI S3.7-1995 Methods For Coupler Calibration Of Earphones, IEC 60318-1, IEC 60318-2
AMC493 mastoid:	ANSI S3.13-1993, IEC 60373-1990-01 Mechanical Coupler for Measurement of Bone Vibrators (patented low thermal mass design varies from design features in standard)
Physical	
SYS008 weight:	21.5 lbs (9.80 kg) Case dimensions: 20 1/2" x 16 3/4" x 8 1/2" (52 cm x 42.5 cm x 21.6 cm)
SYS009 weight:	21.7 lbs (9.85 kg) Fiberglass reinforced airtight thermoplastic case with pressure relief

AUDit™ software's features and functions apply only to supported Larson Davis products. All specifications are subject to change without notice.



Larson Davis
A PCB GROUP CO.

Listen with Larson Davis

1681 West 820 North, Provo, UT 84601 U.S.A. 801-375-0177 Fax: 801-375-0182 mktg@larsondavis.com www.larsondavis.com

D0500.0017

Copyright 2008 SRMi Consulting, LLC

New from Aussco Inc

ACS 100

Audiometer Calibration System

Type I and Type II systems
Clinical, Industrial, Military and School models



Designed to perform an exhaustive calibration on all types of audiometers. Select the audiometer from the list and the ACS 100 sets the headphone type, the impedance and steps you through the correct calibration routine designed for that audiometer.

Plug in the ACS 100 serial cable and be amazed as the ACS 100 controls the audiometer and automatically makes adjustments with no interaction from you.

Print out a customized calibration report on the built in printer, complete with color graphs and your company logo.

Ready

ACS 100
Key Features-Benefits

- Automatic calibration via serial interface
- Exhaustive calibrations in about 6 minutes
- Hand switch and sound room octave band tests built in
- Audiometer specific calibrations
- Track customers, audiometers, headphones, companies, leads and more
- Customized calibration reports
- Accurate more complete calibrations
- Increase your productivity
- Little to no experience needed
- Expand customer base
- Professional look



All packaged in an easy to carry simple to setup, professional looking, leather case.

Set

Call
800-755-8272
or visit
Audiometry.com



Calibrated!!

AUSSCO
Audiological Service and Supply Company

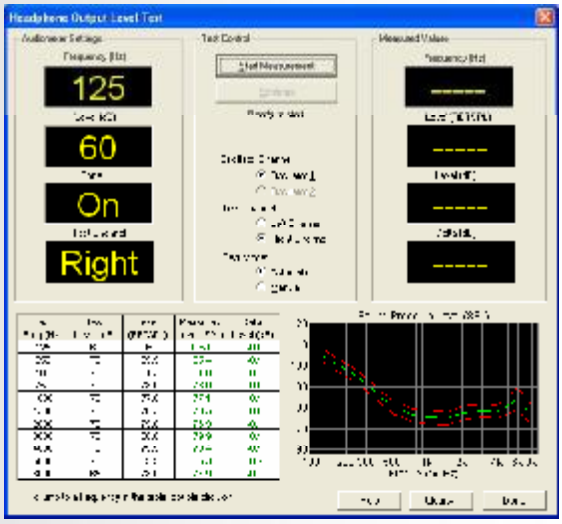
Chicago, Illinois
Palatine, Illinois
Union Pier, Michigan

Copyright 2008 SRMi Consulting, LLC

Software Features

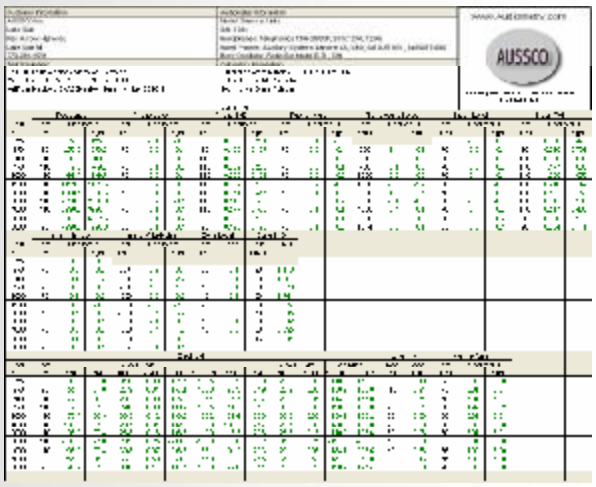


- Select a customer and the audiometer to be calibrated. The ACS 100 will set the impedance and calibration routine specifically designed for that audiometer or make a user defined audiometer calibration routine.
- Run an exhaustive calibration in **Manual**, **User** controlled or **Full** serial interface calibration mode.
- Get measurements and make adjustments in real time. Results in red fall outside the ANSI S3.6 1996 spec.
- Save results in a Microsoft compatible database.
- Print useful reports on calibrations due and calibrations performed. Search database by audiometer serial number, model, company name or date range.
- Calibrate more audiometers in less time
- Accurate, simple and fast





Compatible with standard Windows operating systems.
PCMCIA card slot and serial port required.



AUSSCO Inc.
Audiological Service & Supply Company
Phone: 800-755-8272 Fax::773-427-4863

Visit us on the web at www.Audiometry.com

Copyright 2008 SRMi Consulting, LLC

Copyright 2008 SRMi Consulting, LLC

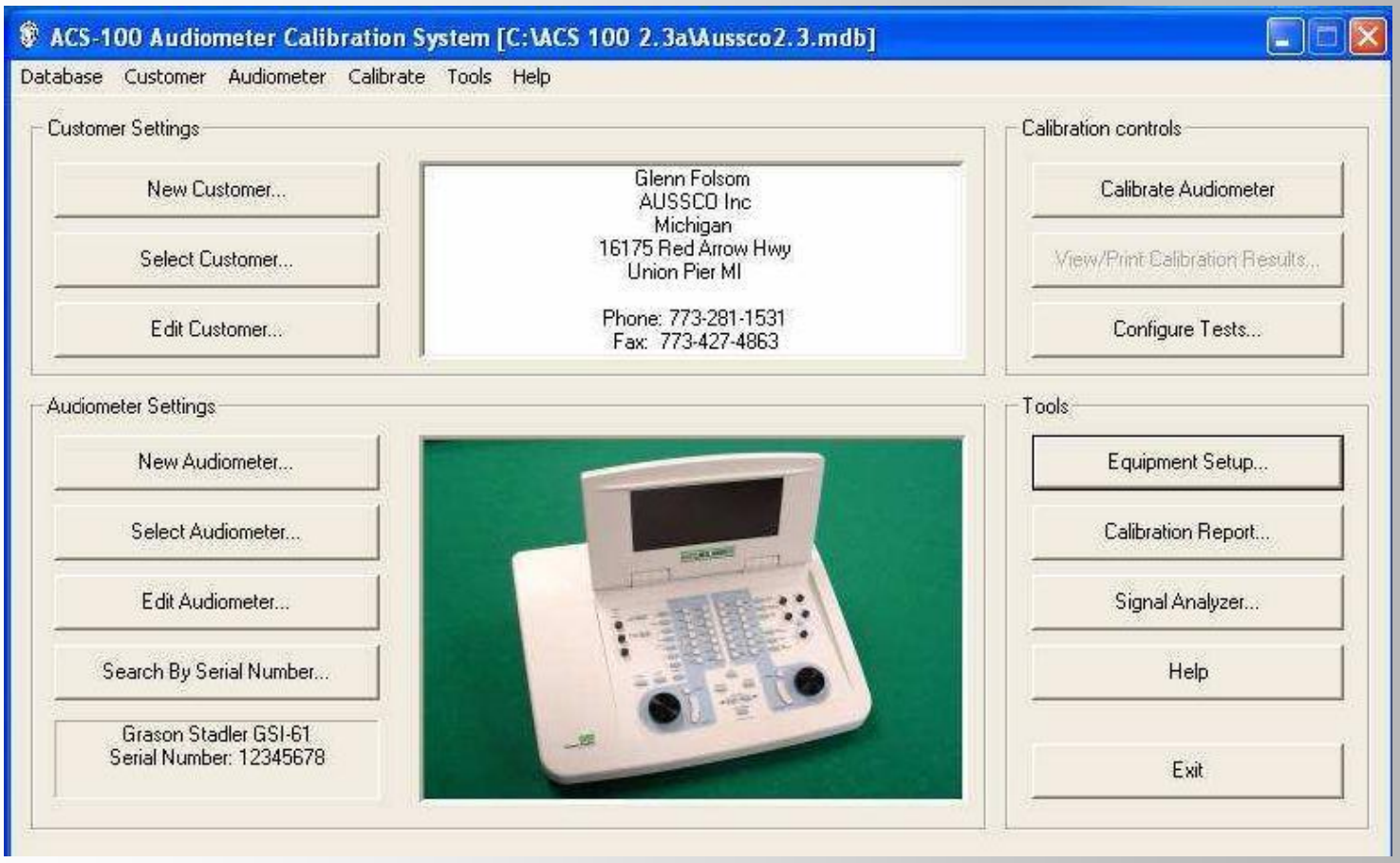
ACS 100

Audiometer Calibration System

Sample Screens

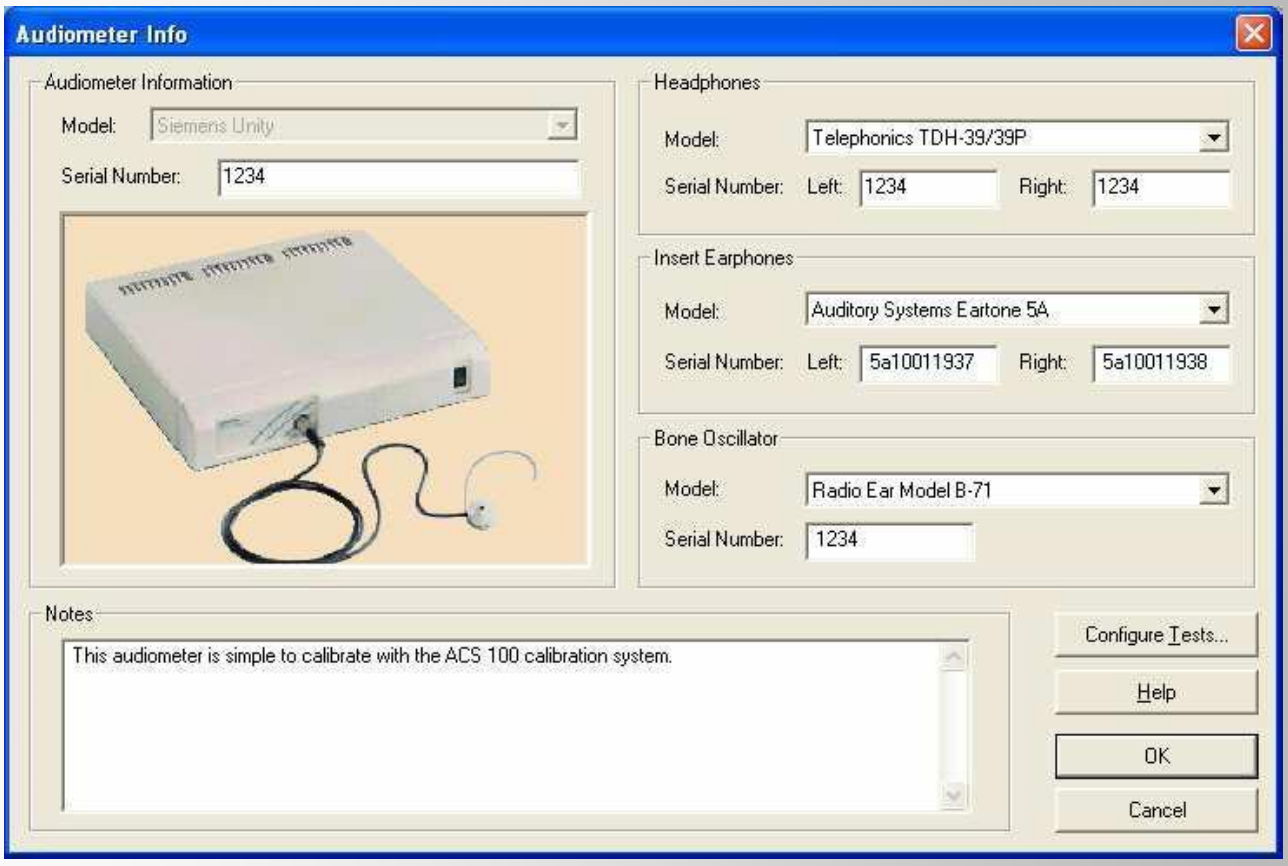
AUSSCO INC.

Copyright 2008 SRMi Consulting, LLC



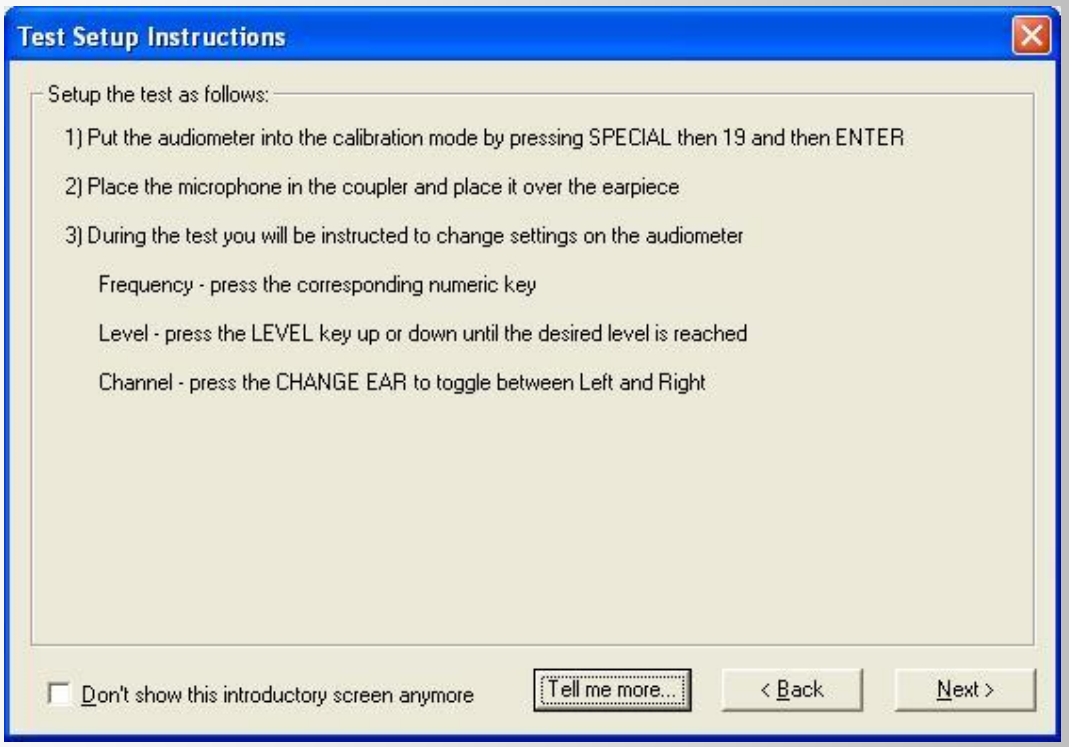
Select the company and the audiometer you want to calibrate

Copyright 2008 SRMi Consulting, LLC



The ACS system remembers which audiometers use 10, 50, 100 or 300 ohm headphones. Store the serial numbers for not only the audiometer but the headphones, inserts and bone.

Copyright 2008 SRMi Consulting, LLC


Test Setup Instructions
Setup the test as follows:
1) Put the audiometer into the calibration mode by pressing SPECIAL then 19 and then ENTER
2) Place the microphone in the coupler and place it over the earpiece
3) During the test you will be instructed to change settings on the audiometer
Frequency - press the corresponding numeric key
Level - press the LEVEL key up or down until the desired level is reached
Channel - press the CHANGE EAR to toggle between Left and Right
Don't show this introductory screen anymore
Tell me more...
< Back
Next >

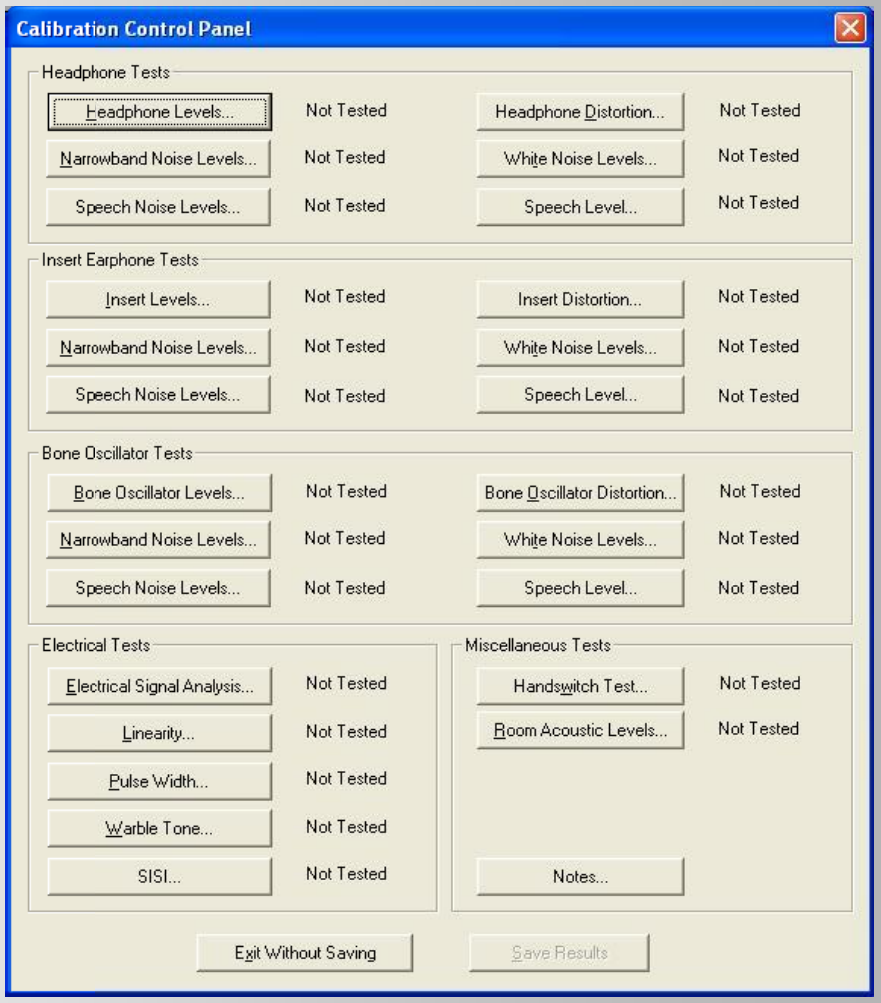
The ACS system displays calibration setup information specific to the audiometer you are calibrating.

Copyright 2008 SRMi Consulting, LLC

The ACS system allows you to choose the test you want to perform.

Simply click on the test and the ACS system prompts you through the rest.

Put the ACS system in the fully controlled mode and watch as the ACS system controls the audiometer and adjusts levels.

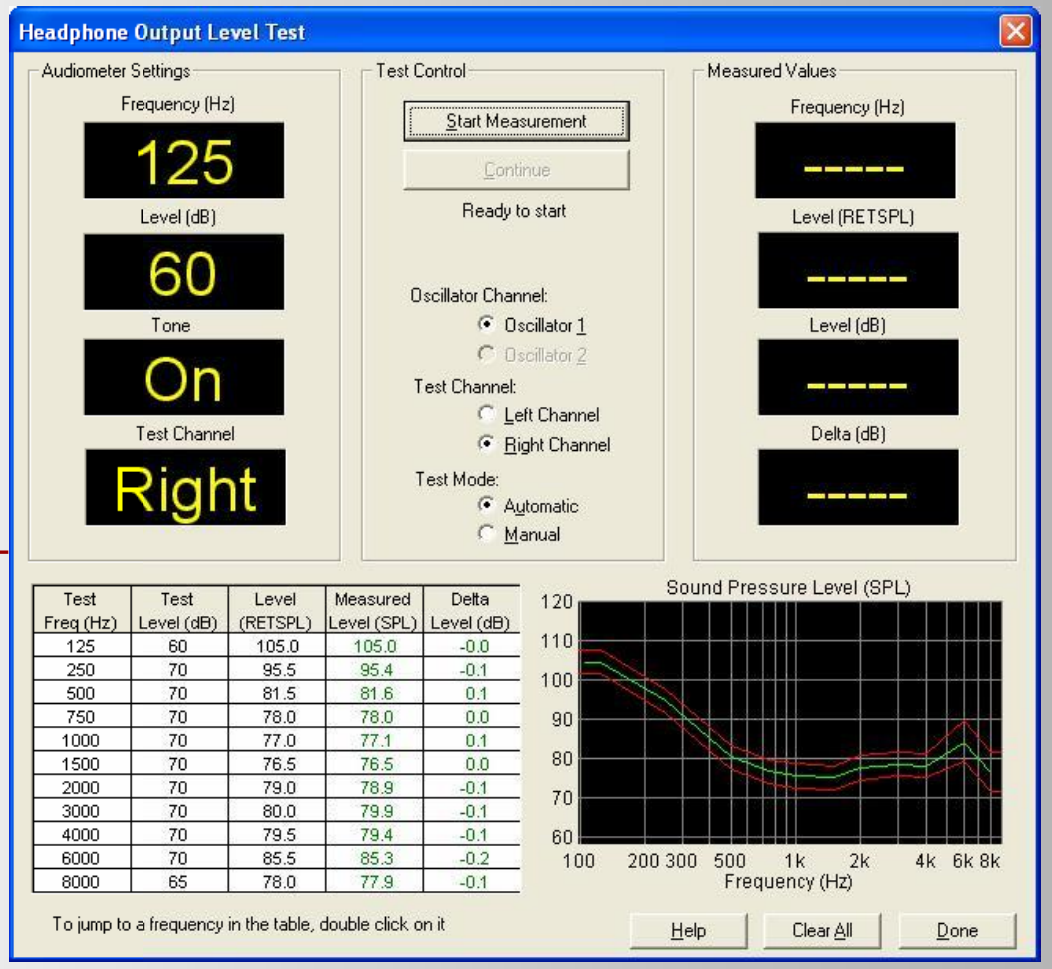


Copyright 2008 SRMi Consulting, LLC

The ACS system not only collects the data but it graphics it as well. If the **green** line is between the **red** lines you know the audiometer is in calibration.

All the measurements are done in real time. The ACS system will even wait for you to adjust audiometer before moving on to the next test.

The ACS system allows you to set the precise threshold for calibration; down to 1/10th of a dB.

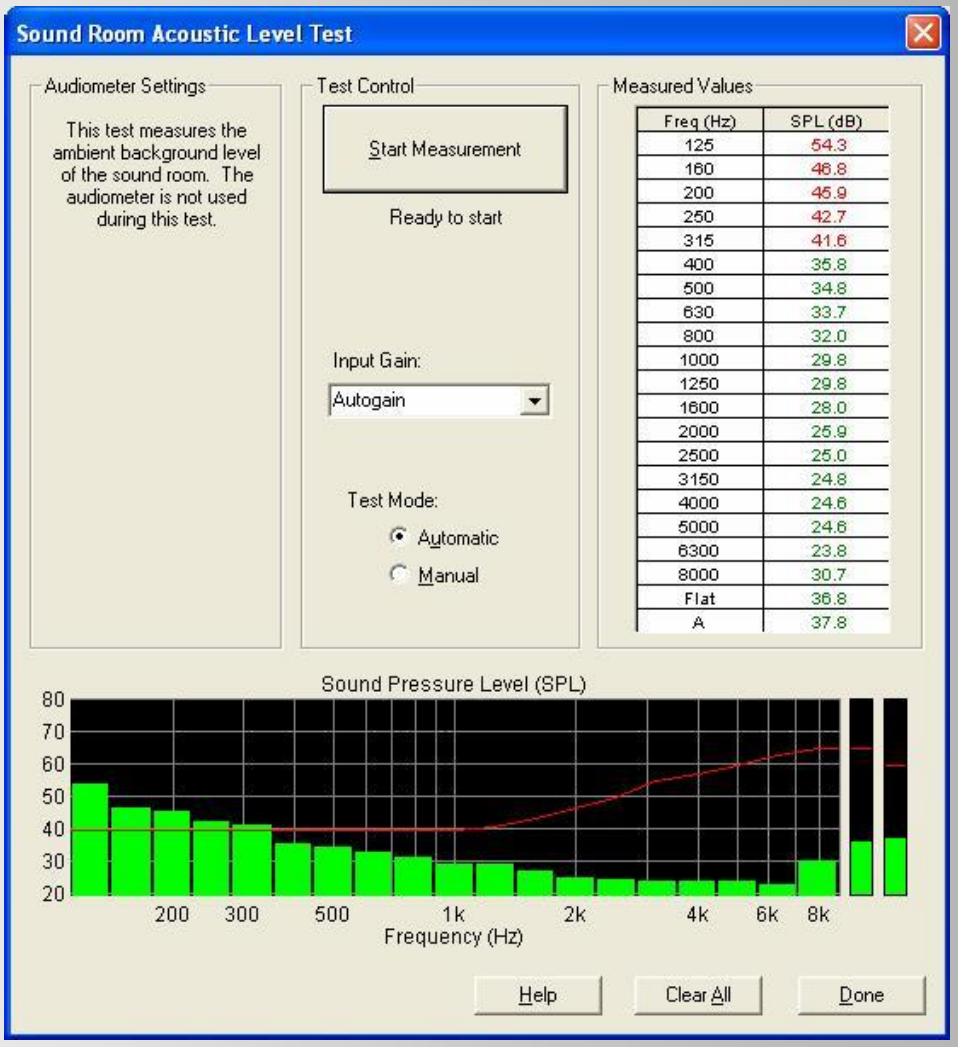


Copyright 2008 SRMi Consulting, LLC

The ACS system will perform an ambient background noise level check of the sound room.

Simple to read.

No small LCD screens here.

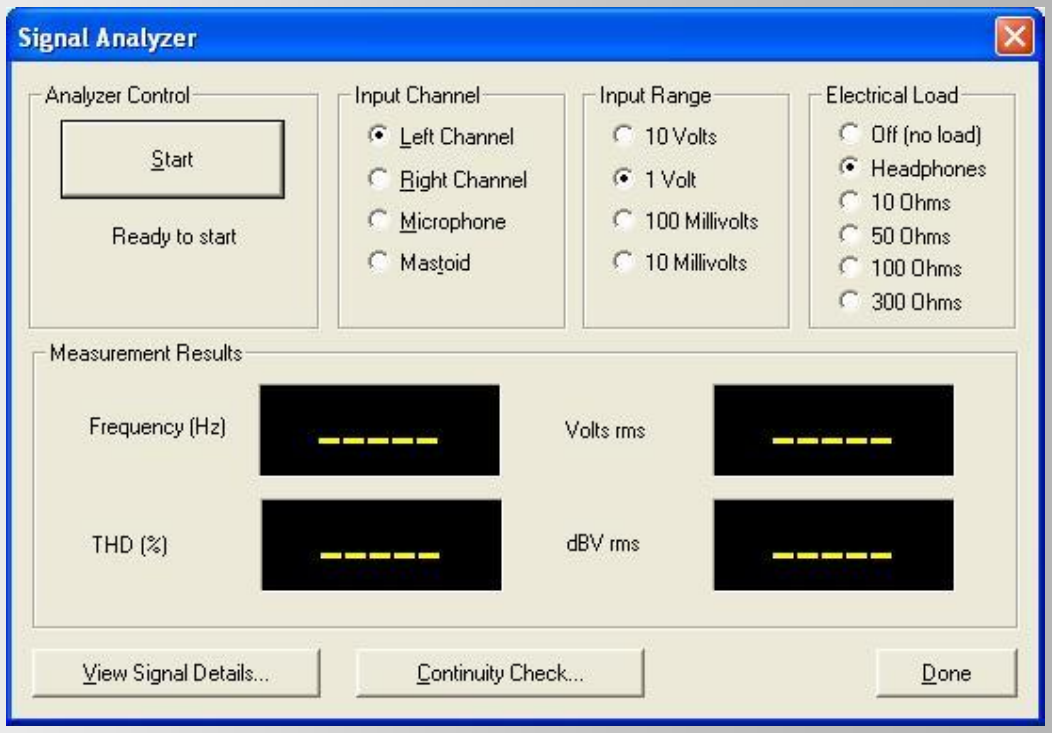


Copyright 2008 SRMi Consulting, LLC

The ACS system comes standard with a signal analyzer.

Trouble shoot that problem audiometer fast.

The ACS system will even allow you to export the signal data so you can plot and graph the data yourself.



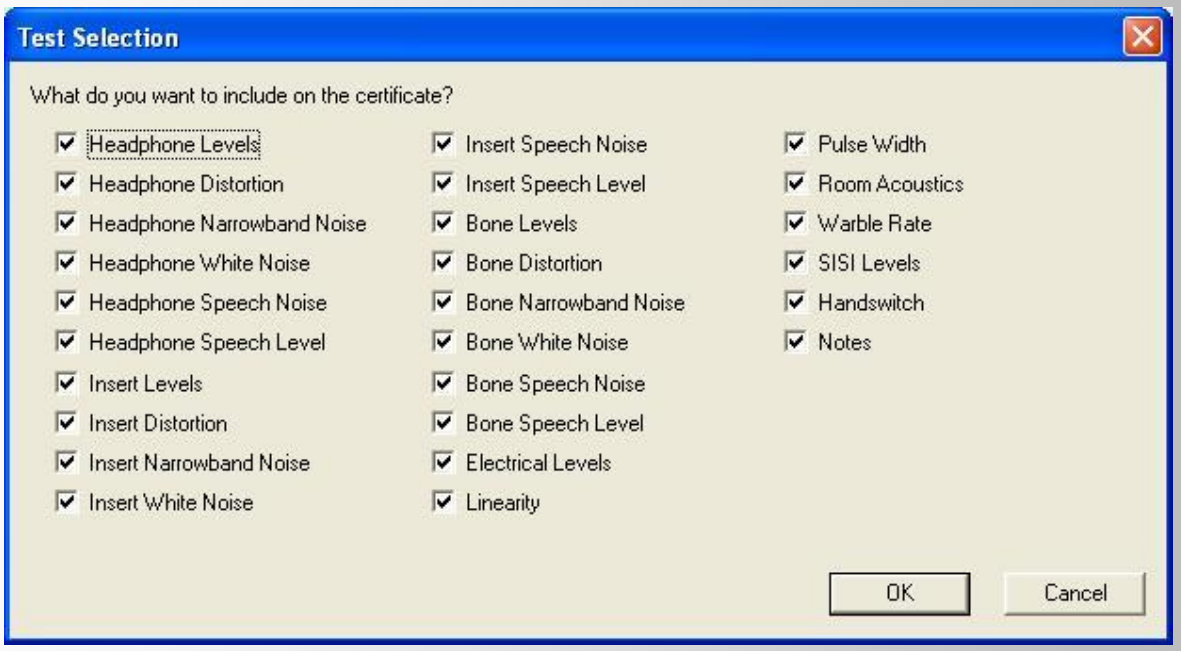
Copyright 2008 SRMi Consulting, LLC

The ACS system automatically tells you if the audiometer has **Passed** or **Failed** calibration based on ANSI standards.

The ACS system will even alert you if you have forgotten to perform a required test.



Copyright 2008 SRMi Consulting, LLC

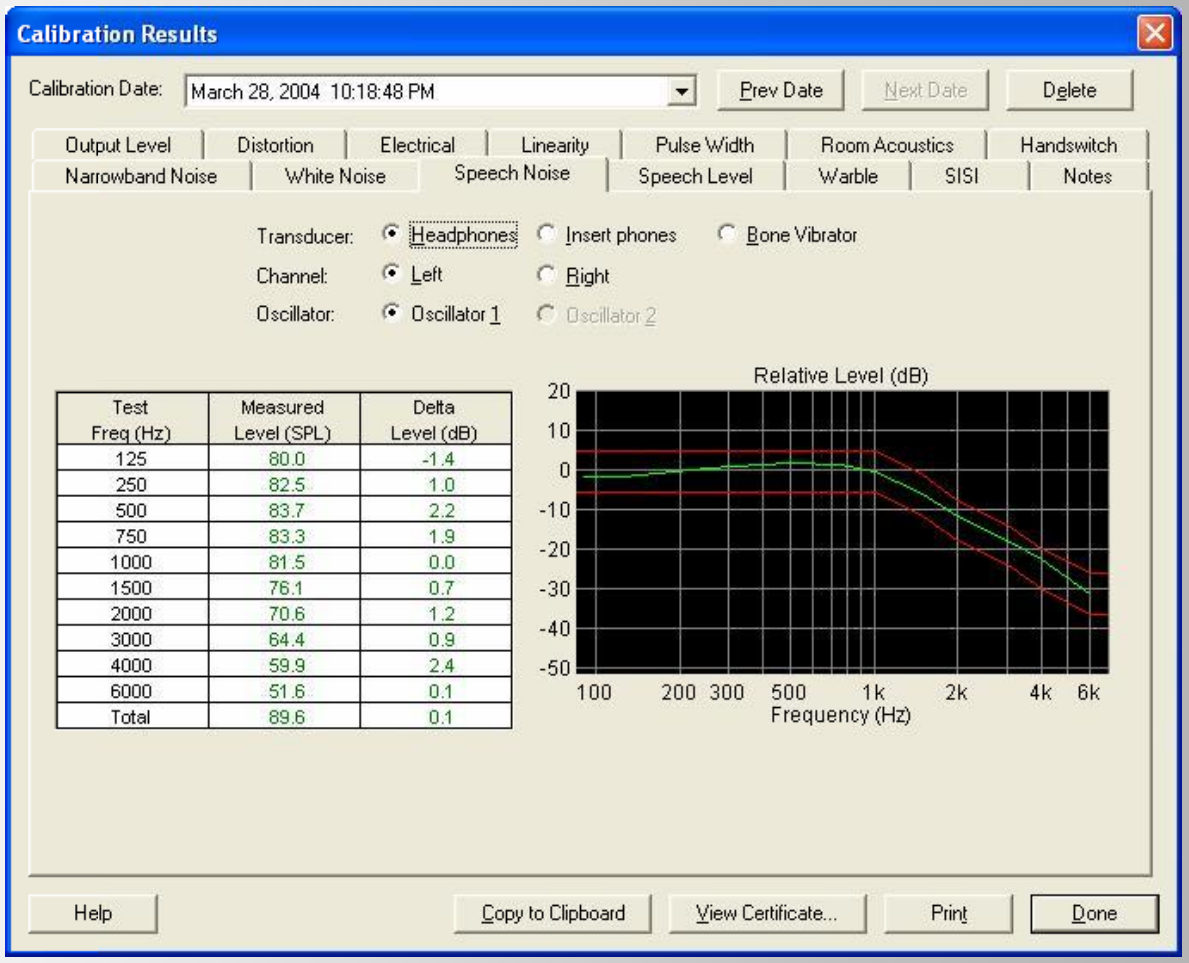


Customize your calibration certificate. Choose the tests that you want to appear on the certificate. If you do not want a particular test to appear the ACS system will arrange the data so there won't be a gap on the certificate. You can even insert our own company logo.

Copyright 2008 SRMi Consulting, LLC

The ACS system lets you tab through the calibration data before you print the certificate.

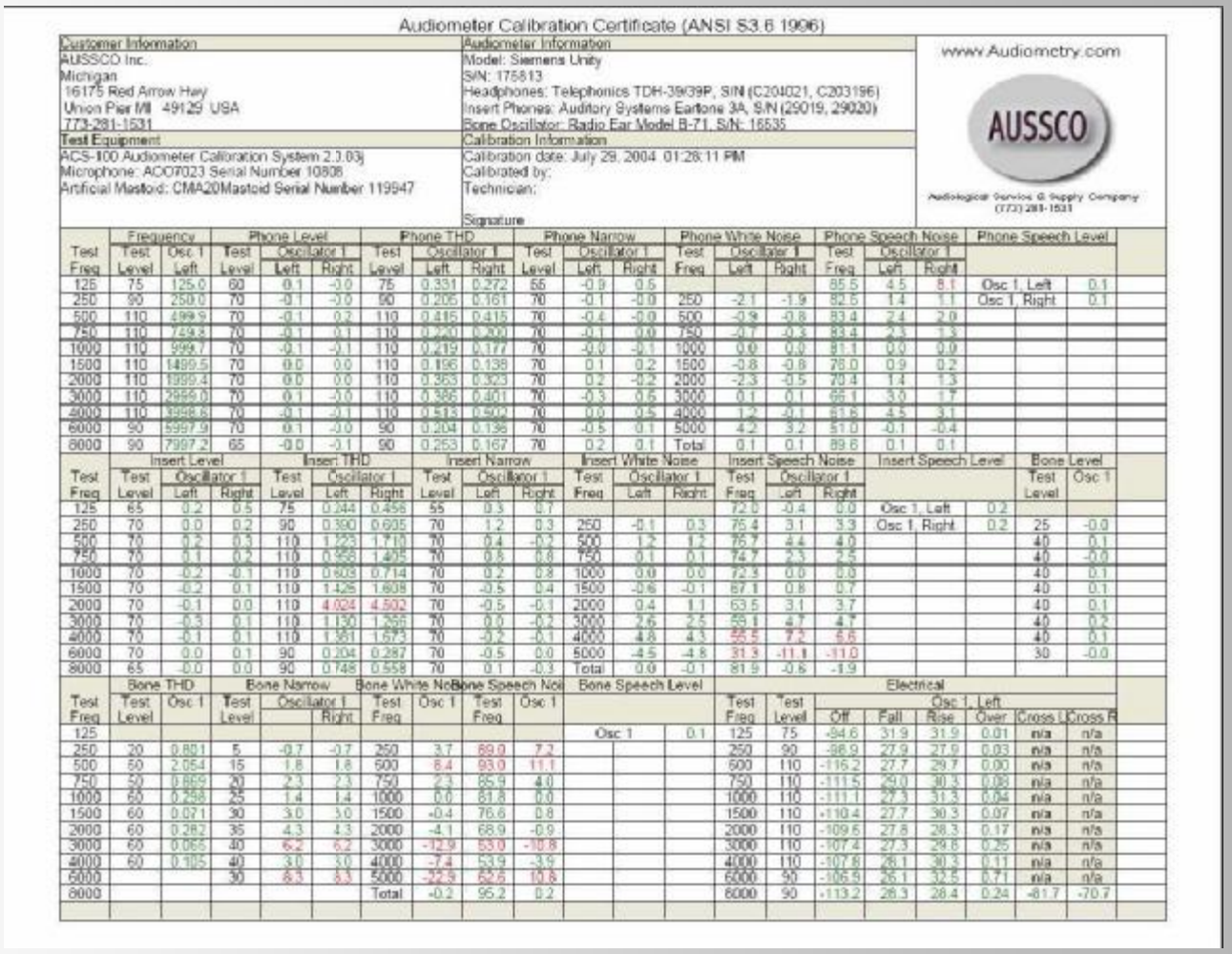
You can even copy the graph to the clipboard to use in other applications.



Copyright 2008 SRMi Consulting, LLC

Print a color calibration certificate. Use your company logo.

Just insert a blank certificate and print the results right on the back



Audiometer Calibration Certificate (ANSI S3.6 1996)

Customer Information	Audiometer Information
AUSSCO Inc. Michigan 16175 Red Arrow Hwy Union Pier MI 49129 USA 773-281-1531	Model: Siemens Unity S/N: 175813 Headphones: Telephonics TDH-39/39P, S/N (C204021, C203196) Insert Phones: Auditory Systems Eartone 3A, S/N (29019, 29020) Bone Oscillator: Radio Ear Model B-71, S/N: 18535
Test Equipment	**Calibration Information**
ACS-100 Audiometer Calibration System 2.3.03j Microphone: ACO7023 Serial Number 10808 Artificial Mastoid: CMA20Mastoid Serial Number 119947	Calibration date: July 29, 2004 01:28:11 PM Calibrated by: Technician: Signature

www.Audiometry.com

AUSSCO

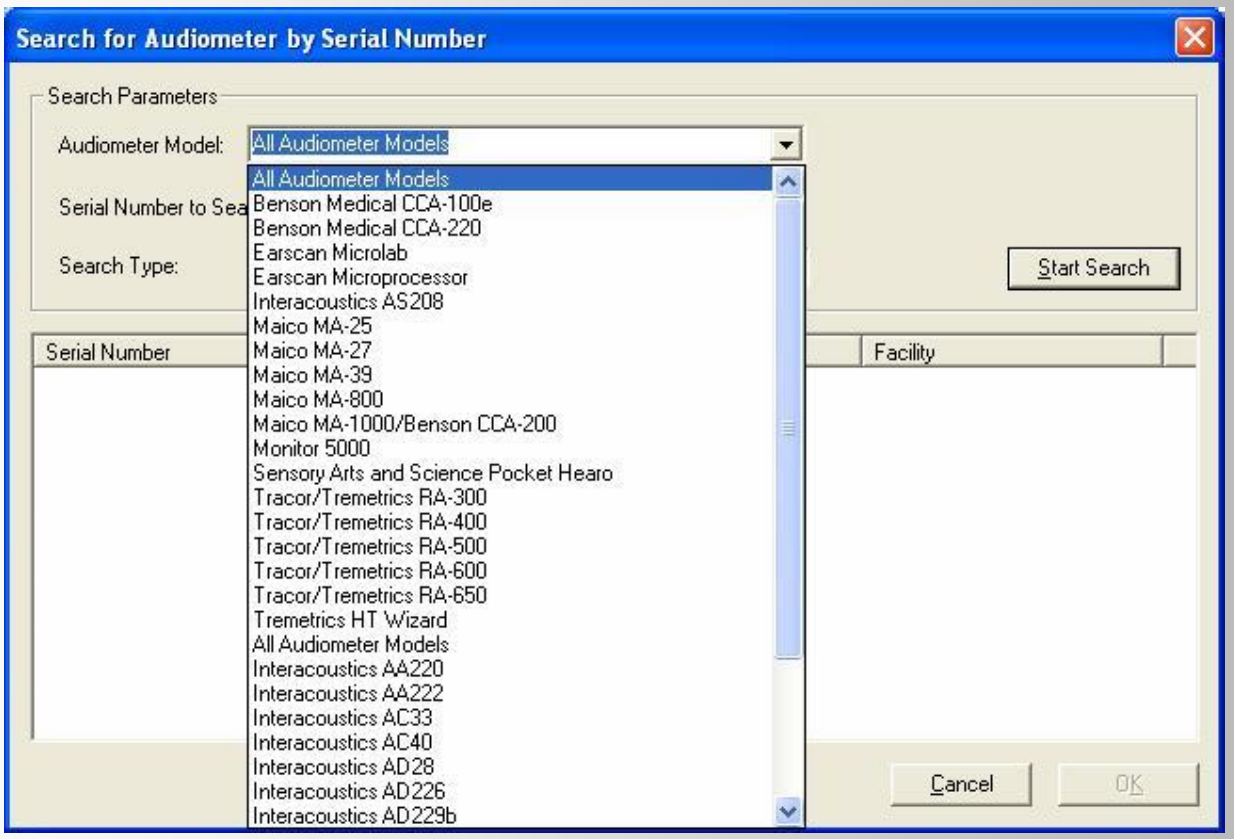
Audiological Service & Supply Company
(773) 281-1531

Test Freq	Frequency: Test Level	Frequency: Osc 1 Left	Phone Level: Test Level	Phone Level: Oscillator 1 Left	Phone Level: Oscillator 1 Right	Phone THD: Test Level	Phone THD: Oscillator 1 Left	Phone THD: Oscillator 1 Right	Phone Narrow: Test Level	Phone Narrow: Oscillator 1 Left	Phone Narrow: Oscillator 1 Right	Phone White Noise: Test Freq	Phone White Noise: Oscillator 1 Left	Phone White Noise: Oscillator 1 Right	Phone Speech Noise: Test Freq	Phone Speech Noise: Oscillator 1 Left	Phone Speech Noise: Oscillator 1 Right	Phone Speech Level	
125	75	125.0	60	0.1	-0.0	75	0.331	0.272	55	-0.9	0.5				85.5	4.5	8.1	Osc 1, Left	0.1
250	90	250.0	70	-0.1	-0.0	90	0.205	0.161	70	-0.1	-0.0	250	-2.1	-1.9	82.5	1.4	1.1	Osc 1, Right	0.1
500	110	499.9	70	-0.1	0.2	110	0.415	0.415	70	-0.4	-0.0	500	-0.9	-0.8	83.4	2.4	2.0		
750	110	749.8	70	-0.1	0.1	110	0.200	0.200	70	-0.1	0.0	750	-0.7	-0.3	83.4	2.3	1.3		
1000	110	999.7	70	-0.1	-0.1	110	0.219	0.177	70	-0.0	-0.1	1000	0.0	0.0	81.1	0.0	0.0		
1500	110	1499.5	70	0.0	0.0	110	0.156	0.138	70	0.1	0.2	1500	-0.8	-0.8	78.0	0.9	0.2		
2000	110	1999.4	70	0.0	0.0	110	0.363	0.323	70	0.2	-0.2	2000	-2.3	-0.5	70.4	1.4	1.3		
3000	110	2999.0	70	0.1	-0.0	110	0.385	0.401	70	-0.3	0.5	3000	0.1	0.1	66.1	3.0	1.7		
4000	110	3998.6	70	-0.1	-0.1	110	0.513	0.502	70	0.0	0.5	4000	1.2	-0.1	61.6	4.5	3.1		
6000	90	5997.9	70	0.1	-0.0	90	0.204	0.136	70	-0.5	-0.1	5000	4.2	3.2	51.0	-0.1	-0.4		
8000	90	7997.2	65	-0.0	-0.1	90	0.253	0.167	70	0.2	0.1	Total	0.1	0.1	89.6	0.1	0.1		

Test Freq	Insert Level: Test Level	Insert Level: Oscillator 1 Left	Insert Level: Oscillator 1 Right	Insert THD: Test Level	Insert THD: Oscillator 1 Left	Insert THD: Oscillator 1 Right	Insert Narrow: Test Level	Insert Narrow: Oscillator 1 Left	Insert Narrow: Oscillator 1 Right	Insert White Noise: Test Freq	Insert White Noise: Oscillator 1 Left	Insert White Noise: Oscillator 1 Right	Insert Speech Noise: Test Freq	Insert Speech Noise: Oscillator 1 Left	Insert Speech Noise: Oscillator 1 Right	Insert Speech Level		Bone Level: Test Level	Bone Level: Osc 1
125	65	0.2	0.5	75	0.244	0.456	55	0.3	0.7				72.0	-0.4	0.0	Osc 1, Left	0.2		
250	70	0.0	0.2	90	0.390	0.635	70	1.2	0.3	250	-0.1	0.3	75.4	3.1	3.3	Osc 1, Right	0.2	25	-0.0
500	70	0.2	0.3	110	1.223	1.710	70	0.4	-0.2	500	1.2	1.2	75.7	4.4	4.0			40	0.1
750	70	0.1	0.2	110	0.958	1.475	70	0.6	0.8	750	0.1	0.1	74.7	2.3	2.5			40	-0.0
1000	70	-0.2	-0.1	110	0.609	0.714	70	0.2	0.8	1000	0.0	0.0	72.9	0.0	0.8			40	0.1
1500	70	-0.2	0.1	110	1.426	1.808	70	-0.5	0.4	1500	-0.6	-0.1	67.1	0.8	0.7			40	0.1
2000	70	-0.1	0.0	110	4.024	4.502	70	-0.5	-0.1	2000	0.4	1.1	63.5	3.1	3.7			40	0.1
3000	70	-0.3	0.1	110	1.130	1.265	70	0.0	-0.2	3000	2.6	2.5	59.1	4.7	4.7			40	0.2
4000	70	-0.1	0.1	110	1.561	1.673	70	-0.2	-0.1	4000	4.8	4.3	55.5	7.2	6.6			40	0.1
6000	70	0.0	0.1	90	0.204	0.287	70	-0.5	0.0	5000	-4.5	-4.8	31.3	-11.1	-11.0			30	-0.0
8000	65	-0.0	0.0	90	0.748	0.558	70	0.1	-0.3	Total	0.0	-0.1	81.9	-0.6	-1.9				

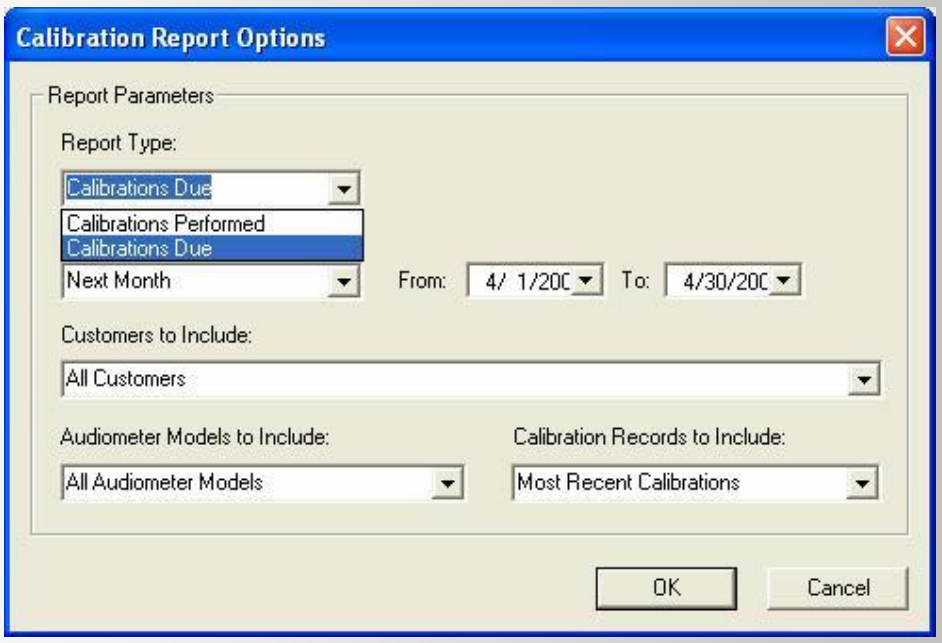
Test Freq	Bone THD: Test Level	Bone THD: Osc 1	Bone Narrow: Test Level	Bone Narrow: Oscillator 1 Left	Bone Narrow: Oscillator 1 Right	Bone White Noi: Test Freq	Bone White Noi: Osc 1	Bone Speech Noi: Test Freq	Bone Speech Noi: Osc 1	Bone Speech Level			Electrical: Test Freq	Electrical: Test Level	Electrical: Osc 1, Left Off	Fall	Rise	Over	Cross L	Cross R
125										Osc 1		0.1	125	75	-94.6	31.9	31.9	0.01	n/a	n/a
250	20	0.801	5	-0.7	-0.7	250	3.7	89.0	7.2				250	90	-98.9	27.9	27.9	0.03	n/a	n/a
500	60	2.054	15	1.8	1.8	500	-6.4	93.0	11.1				500	110	-116.2	27.7	29.7	0.00	n/a	n/a
750	50	0.869	20	2.3	2.3	750	2.3	85.9	4.0				750	110	-111.5	29.0	30.3	0.08	n/a	n/a
1000	60	0.258	25	1.4	1.4	1000	0.0	81.8	0.0				1000	110	-111.1	27.3	31.3	0.04	n/a	n/a
1500	60	0.071	30	3.0	3.0	1500	-0.4	76.6	0.8				1500	110	-110.4	27.7	30.3	0.07	n/a	n/a
2000	60	0.282	35	4.3	4.3	2000	-4.1	68.9	-0.9				2000	110	-109.5	27.8	28.3	0.17	n/a	n/a
3000	60	0.065	40	6.2	6.2	3000	-12.9	53.0	-10.8				3000	110	-107.4	27.3	29.8	0.25	n/a	n/a
4000	60	0.105	40	3.0	3.0	4000	-7.4	53.9	-3.9				4000	110	-107.8	28.1	30.3	0.11	n/a	n/a
6000			30	8.3	8.3	5000	-22.9	52.6	10.6				6000	90	-105.5	26.1	32.5	0.71	n/a	n/a
8000						Total	-0.2	95.2	0.2				8000	90	-113.2	28.3	28.4	0.24	-81.7	-70.7

Copyright 2008 SRMi Consulting, LLC



You can search your audiometer database by model, manufacture, type and serial number to find out where the audiometer belongs.

Copyright 2008 SRMi Consulting, LLC



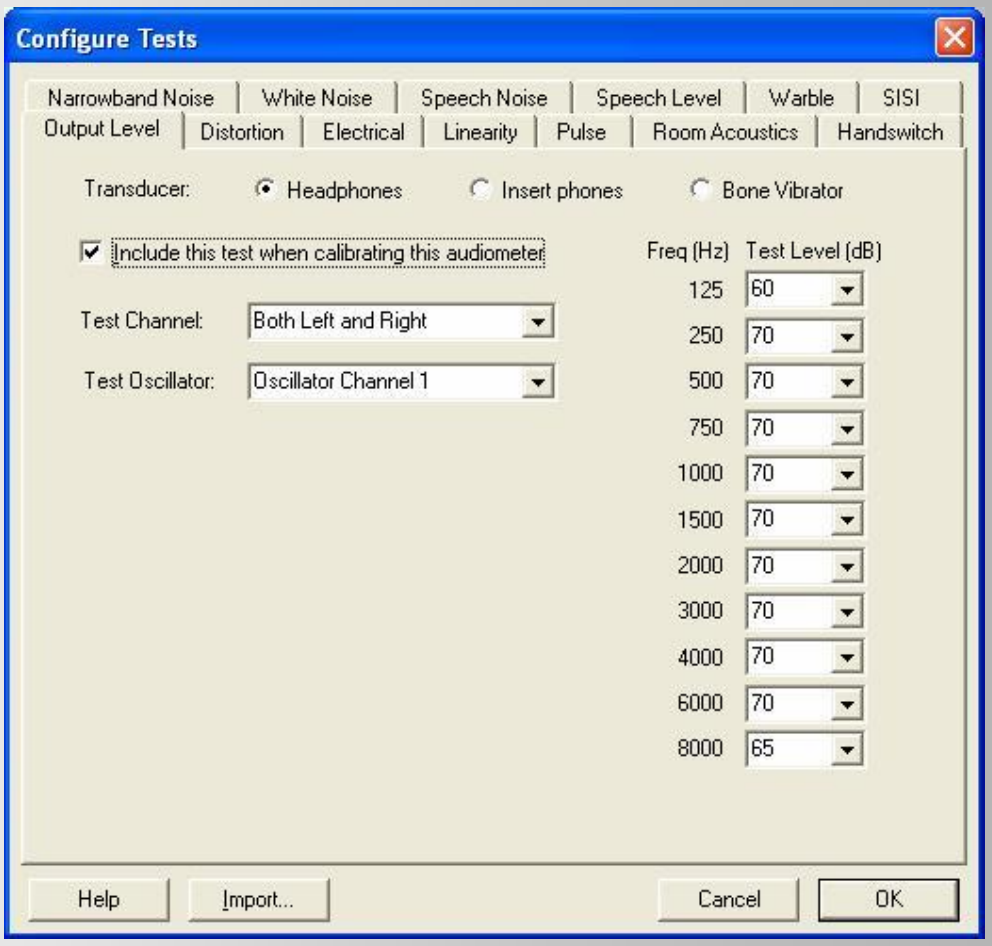
The ACS system will generate custom calibration reports so you never forget a customer. Customers due, done, this week, next month all at your finger tips.

Copyright 2008 SRMi Consulting, LLC

The ACS system allows you to customize the calibration tests themselves.

The ACS system comes with these already set for many makes and models of audiometers.

You can even make a user defined audiometer for those old or off brand audiometers.

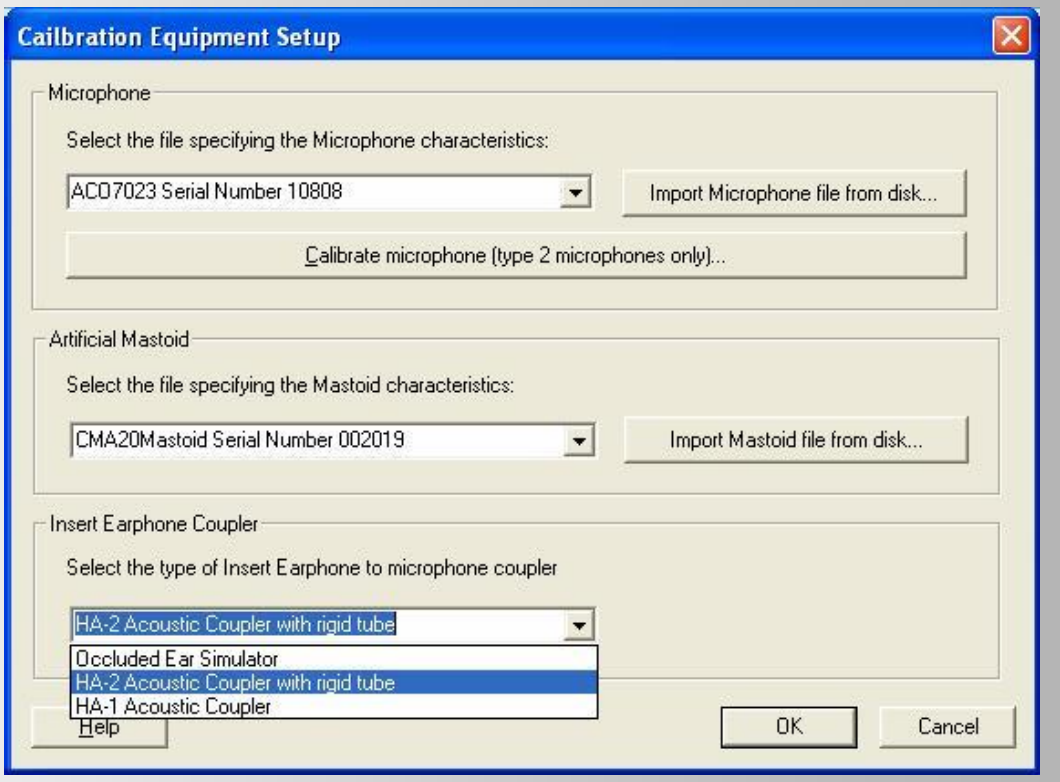


Copyright 2008 SRMi Consulting, LLC

The ACS system allows you to use the microphones, artificial mastoids and couplers you already have!

The ACS system has built in correction tables for the different response curves of microphones.

Connect a piston-phone and check the calibration of the ACS system in seconds.


Cailbration Equipment Setup
Microphone
Select the file specifying the Microphone characteristics:
ACO7023 Serial Number 10808
Import Microphone file from disk...
Calibrate microphone (type 2 microphones only)...
Artificial Mastoid
Select the file specifying the Mastoid characteristics:
CMA20Mastoid Serial Number 002019
Import Mastoid file from disk...
Insert Earphone Coupler
Select the type of Insert Earphone to microphone coupler
HA-2 Acoustic Coupler with rigid tube
Occluded Ear Simulator
HA-2 Acoustic Coupler with rigid tube
HA-1 Acoustic Coupler
Help
OK
Cancel

Copyright 2008 SRMi Consulting, LLC



Audiological Service & Supply Company
800-755-8272
Audiometry.com

ACS 100

Auto Cal System

Changing the industry

800-755-8272

Fax:773-4274863



AUSSCO INC.

Copyright 2008 SRMi Consulting, LLC